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A Sketch for the Future of Westminster.

TO those who are interested in the progress and the changes of various parts of London, it must be obvious that a considerable alteration in the neighbourhood adjacent to the Palace of Legislature is likely to take place before long. The spirit of rebuilding, clearing, and beautifying has drifted that way for some time past, and Victoria-street is one of the results; but extensive rebuilding has already been achieved in other sites in the district, of such a nature and in such positions as must inevitably lead to further operations. Indeed, it may well be matter for surprise that the erection of so great a building as the Parliament Houses has not exercised a more speedy influence on the architectural remodelling of its environment. For the existence of this building, with its two great towers so completely associated with modern London, and the proximity of the Abbey (which is still more hallowed in its artistic and moral associations, though standing less prominently forth as a landmark), undoubtedly render Westminster in effect the architectural centre of London; and with equal truth it may be said that it is the historical centre of London, when we consider the supreme importance of the one building in reference to the life of to-day, and that of the other as the shrine of the memorials of the past of England.

Compared with Westminster Abbey, even St. Paul's must take a secondary place in architectural and historic interest; and when we regard the whole material and historic importance of Westminster for a long period past, we must feel that the City, the original nucleus of London, sinks into comparative insignificance from this point of view, whatever conventional civic importance may still be assigned to it. Regarding Westminster, therefore, as the real centre of London, and considering the state of change in which property in its neighbourhood now is, and the very great need of change, rearrangement, and improvement in many portions of the district, it seems very much to be desired that some definite object should be kept in view in regard to these changes, that they should not be suffered to grow up piecemeal and in such a way as to interfere with and neutralise each other, but that, so far as is possible in accordance with what has been already done, the improvements carried out should "orb into a perfect whole," or, at least, should be grouped effectively and with a certain degree of system round those points which seem naturally to suggest themselves as central features, in such a way as to make the most of the opportunities for adding to the beauty and architectural effect of the neighbourhood.

In proposing any scheme as worth adopting, it does not, of course, necessarily follow that this should be only such as can immediately, as a whole or in its main features, be carried out; or that anything which cannot thus be immediately available should be regarded as Utopian and chimerical. It is a sufficient concession to the practical side of the question if what is proposed be a reasonable and desirable scheme as a whole, and its execution possible in due time and at convenient intervals. The scheme we are here suggesting, and of which we append a general plan, without which our remarks would be unintelligible, is, we believe, perfectly feasible as a whole; and it has, as we shall be able to show, this recommendation, that in nearly all its principal points it arises out of, or carries to completion, ideas of improvement which follow naturally upon the lines of what has been already done, and which, considered separately, would most probably be done sooner or later. Our object is that they should be done, not independently and piecemeal, but systematically, and in relation to one another as parts of one plan.

Glancing at our proposed map of the Westminster of the future, then, the first alteration we propose is what must have been for some time seen to be inevitable sooner or later,—the widening of the southern end of Parliament-street by setting back its western line of frontage to the line of the present Foreign Offices. This is a necessary improvement, even as a matter of ordinary convenience, in a part of the street where, during the Parliamentary session especially, traffic is so heavy. But it is rendered a matter of course by the proposal of Government to take the land between Great George-street and Upper Charles-street for new offices. The improvement would in either case mean, of course, the abolition of King-street, the narrow back street dear to cabmen as a supposed short cut, but which has an historical interest from the important part which it once played (still remembered in its name) as a route of royal procession to Parliament upon State occasions. It is a pity that a street with so interesting a history should be obliterated, and it may well be suggested that in the building of the new offices some record should be embodied in them of the site and name of this historic alley. At the further end of the new block of buildings we have shown Delahay-street, still retained in its name, and nearly in its position, only with the twist taken out of it. There is a word to be said about this corner of the plot of land. The original aim of the Office of Works was to purchase the whole piece of land between St. James's Park and Parliament-street, demolishing of course the whole of the buildings now standing on the site. This would have involved the destruction of one of the most interesting and best preserved seventeenth-century houses in London, situate just in the turn of Delahay-street, and which has the historical interest of having once been the abode of Judge Jefferies, of evil memory. This interesting house we are glad to be informed is in any case to be spared, and the angle block including it to be left as an "island." The rest of the small space west of Delahay-street and between it and the park (see A on plan), we should propose to retain on the same level as Upper Charles-street (which is raised by a flight of steps from the Park), and turn it to advantage as a small ornamental balustraded garden,* an oasis in the region of Government offices.

The proposal to build a new block of these on the north side of Great George-street must be almost necessarily followed, at no very long period, by the rebuilding of the south side of the same street, thus completing what we have long regarded as an improvement greatly called for on architectural grounds at least. Such a building as the Westminster Palace should have fine and dignified approaches, and there is a decided anti-climax in the sight of the visitor approaching from the west, when, after traversing Birdcage-walk, he finds this very uninteresting street of dingy brick houses, turned (mostly) into offices, interposed between the boulevard he has left and the great building he is approaching. Great George-street ought to be made, as soon as possible, a fine and worthy architectural approach to Westminster Bridge, the Embankment, and New Palace-yard. At the same time the entry between this line of road and St. James's Park (B) may be made more dignified by removing the small lodge standing in the centre of St. James's Park walk to the west side of the walk, or rather by building a new lodge in that position, and connecting it with the end of the Great George-street buildings by an open colonnaded screen with an entrance-gate, somewhat after the manner of the Hyde Park-corner entrance.

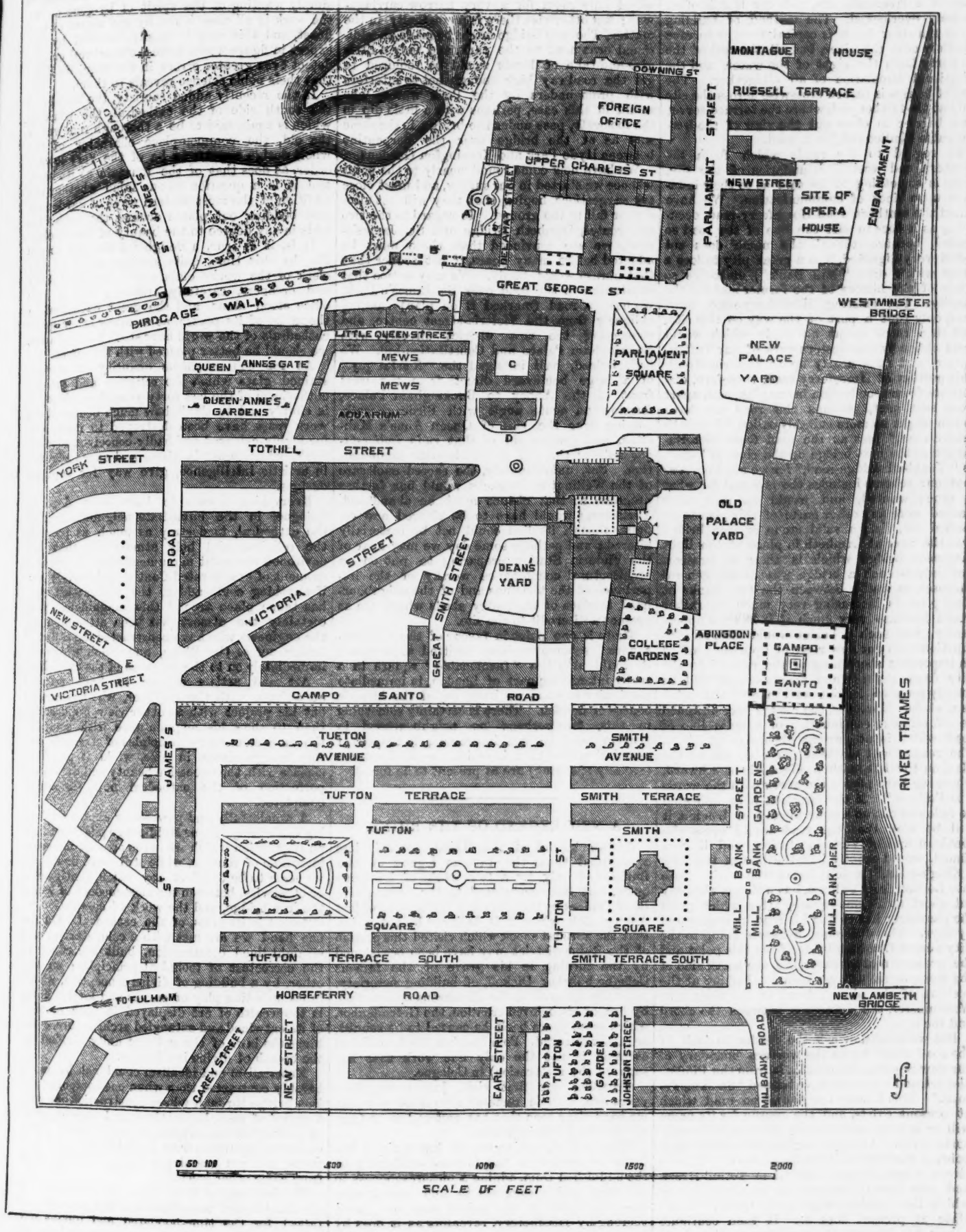
There are, however, other than merely architectural reasons for the rebuilding of the southern side of Great George-street; for, owing to the change in the social character of the neighbourhood which is obviously impending, the clearing away and rebuilding of the narrow and mean little streets contiguous to the site now occupied by the Aquarium is almost a matter of course. We do not mean to infer that the existence of the Aquarium in itself renders this necessary; for, on the contrary, the intrusion of this establishment into the neighbourhood of the Abbey and its surroundings is the principal obstacle at present to the advancement of Westminster to the position

* Unless it be decided to leave all the houses in this strip, and fronting the park, *in statu quo*. Some of them seem too good houses to be lightly removed, though the collection is rather a motley one; but none of the interiors, we believe, have the architectural and historical interest of the special house above referred to.

of a first-class neighbourhood. In regard to the most serious part of the objection felt to it by those already living in the neighbourhood, an amelioration is, of course, possible. Architecturally the building is there, and must be made the best of, though it is lamentable that so tawdry an erection should have been allowed to flaunt in the precincts of the Abbey, and spoil the whole architectural genius of the place. But it would be possible that the building might be made available as a winter-garden and a place of recreation of a higher class than it is at present, and it has, at all events, provided in advance a theatre for the new neighbourhood. The other building which has interfered sadly with the possible future architectural character of Westminster is the now well-known Queen Anne's Mansions. There is this to be said, however, for this warehouse-looking pile of dwellings, that it has the negative merit of being purely and simply ugly, nothing worse,—neither tawdry nor pretentious; and in other ways its existence has probably formed a considerable influence in the improvement of the neighbourhood. The treatment of the property stretching from this point to New Palace-yard seems to resolve itself into this. The very interesting eighteenth-century houses on the north side of Queen Anne's-gate, and looking over the Park, ought certainly to be left untouched; they are, it is true, very badly built and ill-drained; but the latter evil is capable of amelioration, and the houses, which once formed one side of what was then called Queen-square, have considerable historical interest, the place having held at one time much the same social estimation as a fashionable place of residence which Grosvenor-square holds now. Those on the south side, though not all equally interesting, have the same kind of claim to consideration, and belong partly to the same period; but the property south of these, and intervening between Queen Anne's-gate and Broadway, would have to be cleared (and in many respects the sooner the better), and a line of superior buildings substituted, continuing the north line of Tothill-street as defined by the Aquarium buildings, while an open space might be left between these and the Queen Anne's-gate houses, and the site receive the name of "Queen Anne's Gardens." The oblique line of the narrow street (Dartmouth-street) separating this property from the west end of the Aquarium, must be retained now, as the latter building has adopted and fixed the line of the street, rather unfortunately. Coming eastward, the houses along about one half of the north side of Little Queen-street are good residences of some interest; the rest of this side of the street would have to be rebuilt, and as this new portion of the street would immediately face our proposed new gateway to St. James's Park, there would be every inducement to build houses worthy of the position. The ground on the south side of Little Queen-street, and between it and the Aquarium, would be the best utilised as mews,—it would be of very little use to put houses of a good class in that position, and new mews would be wanted for the neighbourhood, as the proposed Government alterations will disestablish one set of mews contiguous to King-street, not to mention one or two other smaller ones which our improvements would abolish. The next question is what to do with two or three large and not unimportant buildings which adjoin the neighbourhood of Great George-street and New Palace-yard; the Stationery Office (C); the Westminster Hospital (D); the Guildhall, &c. The Westminster Hospital, on which a good deal has been spent lately, and which is a quiet building in unobtrusive style and good taste, no one would propose to interfere with; and the Stationery Office immediately in its rear, though a building which nothing could render interesting or attractive, it would probably be very inconvenient to move far from its present site; but it can be left where it is, and shut out from interfering with architectural amenity. But the Guildhall is a building of no beauty, and little or no interest in itself, and as a police court, it is, in its present position, a great nuisance already, and would be still more so when regarded from the point of view from which we are at present proposing to regard the Westminster neighbourhood. Under these circumstances it appears to us that the Guildhall and the buildings in its rear might very well go, and we have then the opportunity of making a grand *place* in connexion with the Houses of Parliament and the Abbey, stopping short the new line of houses south of Great George-street as soon as they are clear of the back of the Stationery Offices, and then turning them round, to hide the east side of these offices, and form a fine terrace of houses or business buildings facing the Houses of Parliament. We should then have, instead of the small enclosure of grass and flower-beds now seen at this point, a square large enough to be planted with trees in the centre, which would make a splendid combination with the surrounding architecture—a square opening out the whole north flank of the Abbey on one side, with the Houses of Parliament skirting it on the east, and part of the new Government offices on the north. By way of giving more architectural interest to these new offices and to the street and square which they would adjoin, we have proposed them arranged in two courts, with open arcades or colonnades on the south side, giving a perspective view of the quadrangles from Great George-street, and "Parliament-square," as we would propose to call our big square. The fountain which now stands at the south-east corner of Great George-street might be worked into the new site, and the various statues of eminent Parliamentary leaders which are already placed in the present open space, and those which may join them in future, would be placed with equal or better effect around the new enlarged square. Finally, we might suggest, as a completion to the *coup d'œil*, the removal of the ugly and incongruous upper half of Westminster Abbey towers, and the rebuilding of this portion of them in accordance with the lower portion and with details which are not so mere a travesty of Gothic as those of the present towers; while a well-designed and not too pretentious *flèche* on the crossing would complete the whole.

Turning now towards the Houses of Parliament, we of course assume that the courts and their accessory buildings adjoining Westminster Hall may come away eventually, as they will be provided for in the new Law Courts. By this means, therefore, the narrow gut between them and Henry VII.'s Chapel will be widened, and Old Palace-yard more opened out than before, and a better view obtained of the Victoria Tower from "Parliament-square." We now come to the vacant space of land south of the Houses of Parliament and fronting the river, where it was long ago suggested that a kind of *Campo Santo* should be formed, where monuments of distinguished men might in future find place, instead of further crowding up the Abbey. This suggestion, already made and talked about with favour, we have therefore assumed as carried out, arranging the space in the form of a cloister, with perhaps a central feature in the middle of the court for receiving some of the more important and prominent monuments. Opposite this the houses now forming Abingdon-street are removed, and the frontage line set back, and the wider area thus formed becomes "Abingdon-place," by way of keeping up old names, which it will be seen we propose to do in all cases where it is possible and not inconsistent. And now we come to the consideration how far it is possible to lay out Westminster, or any part of it, as a first-class neighbourhood for residential purposes. For such a purpose it must be confessed we find ourselves restricted within certain rather narrow limits. Gasworks and breweries, it is true, on whatever scale, may have notice to quit; but when we get south of Horseferry-road we find ourselves stopped by the Millbank Penitentiary; and when we go westward towards Victoria Station we are brought up in like manner by the Middlesex House of Correction; both of these being too hard nuts for the improver to crack; too big and expensive buildings to be lightly removed, and quite unfit for inclusion in districts to be inhabited by those who are too respectable to commit the kind of sins for which these *loci penitentiæ* are made and provided. And in regard to the Victoria district, the status of the neighbourhood has already been pretty well fixed by the new terraces which are run at various oblique angles through the old lines of streets, and which certainly are not first-class, though eminently respectable-looking in their way. It is a pity, we may observe in passing, that the oblique line of Victoria-street,—very convenient and right as a traffic line,—has been made the basis for all the new laying-out of the Pimlico district as far as it has been proceeded with; the consequence is that everything is at angles and elbows, and the shapes of the building sites, both occupied and unoccupied, are compelled into very awkward and very wasteful forms with unmanageable acute angles at every turn. To return to our immediate subject, it will be seen that in consequence of the obstacles we have mentioned, we are restricted very nearly to the region bounded by Horseferry-road on the south and west (the present Horseferry-road goes round a corner) and by the river on the east. But this is not at all a bad site to operate upon. It consists mainly of narrow, unhealthy, and dingy streets, some of them, we may add, very immoral streets, the clearing out and rebuilding of which would be a benefit in every way. What we propose is that a clean sweep should be made of the whole of this, and that on the site thus cleared there should be formed what we may call another Eaton-square, rather larger, and we may hope better, in an architectural point of view, and with the advantage of a river-frontage contiguous to the site.

A glance at our plan again will show how we propose to do this, and at the same time to preserve some old landmarks and old names, and to make material improvements in the main lines of traffic going over this portion of London. In the first place, it will be seen that next to the river and passing across the eastern end of our site we propose an embankment garden running from the Campo Santo down to the end of Lambeth Bridge. This garden it would probably be necessary to place under certain restrictions as to right of entry, so as to prevent it from becoming flooded by incursions of the multitude, and keep it reserved as a special enjoyment for the residents in the neighbouring square; adding also a semi-private water-stair or pier for their use when required. Our site is bounded on the north by a road running east and west and connecting the Campo Santo with a point in the middle of Victoria-street, where also some other routes meet, of which more just now. The Campo Santo building would have a leading architectural feature over the principal entrance opposite the end of this road, so as to make an architectural object to be seen along the road, and also commanding the gardens: for we have kept in view throughout our plan the importance of so arranging the alignment of roads as to obtain effective views and vistas; a matter, as we have often remarked, so much disregarded in England, and which has certainly been even more than usually neglected in metropolitan improvements. Now this road, which we have called "Campo Santo Road" (as there is no name on the site of it which seems worth preserving) is already in effect proposed to be commenced, for its western portion is identical with the new line of street proposed by the Metropolitan Board of Works in connexion with what is termed the Old Pye-street improvement scheme, the plan of which is now to be seen at the Board of Works Office. It is an application (proposed) of the Artisans' Dwellings Act, not specially a street improvement scheme, but it involves the substitution of a straight and wider street for the present crooked lane called Old Pye-street; which new street, as observed, is on the lines of our "Campo Santo-road," so that here again we are going hand in hand with improvements which are feasible and are already contemplated, and assisting them to a further development. With the odd angles of Dean's-yard and College Gardens and their adjacent buildings, including the rambling Westminster School buildings, we have not, of course, shown the slightest hint of interference, which would be absurd. But south of Campo Santo-road a new Tufton-street crosses our residential district at right angles. This is very nearly on the lines of the existing Tufton-street, and only deviates from them in order to keep a right angle (which is more convenient for laying out houses and terraces), and to get the west towers of the Abbey visible along the whole street as a culminating object. We shall see, too, that the line of street has an object if we turn the other way and look southwards, for there we find it terminates opposite what is now called on the Ordnance map "disused graveyard," but which is really a very nice good-sized open piece of field, railed in and planted with trees, and apparently used by nobody for any purpose, but which we suppose to be laid out as an ornamental ground under the name of "Tufton Garden," with a handsome gateway central with the end of the street. On the principle of keeping to the old names of a site as much as possible, Tufton-street gives its name also to the greater portion of one residential district lying westward of it, and which divides into Tufton Avenue (a broad boulevard) Tufton-terrace (north and south), and Tufton-square, with a central garden.



It will be observed that the longitudinal axis, as we may call it, of the land, is not midway between the northern and southern boundaries; and we see the reason of this on turning to the other portion of the land eastward of Tufton-street, and nearer the river. Our principle is to make as much use as possible of existing objects of importance as centres of arrangement and of vista; and here we find that the large and well-known church (St. John's) so conspicuous an object from the river, and which has been often irreverently compared to an elephant with its legs in the air, is obviously the dominating object. It would be absurd to think of removing it; nor, in spite of the sneers that have been directed against the building, is it destitute of a certain dignity and impressiveness. What we must do, therefore, is to help this as much as possible by arranging the site so as to make the church the centre and culminating point of the whole. We not only make it a central object from the Square gardens, but we open it out to the river, and place the main cross walk of the river garden and the river stairs centrally with the church. The church at present stands in a small and cramped square, called Smith-square, which, small and quiet as it is, forms at present the principal centre of this corner of the district, and is the only portion which we should feel some compunction at removing; for the houses, though small, seem well built, and are good specimens of brick building at a time when work of this class was better done, though with less show, than it generally is now. But the square is very cramped, and would be the better for opening out; so we remove the old houses, but keep the old name, Smith-square, leaving the church still as the centre of the square, but with a wider space on every side. Smith-square again gives its patronymic of Smith to the adjacent avenue and terraces, just as Tufton-square does on the other side of the road. The road running north and south between Smith-square and the gardens occupies the line of the present Millbank-street, and retains the name with its indication of the nature of the locality in early days. It will be observed that all the lines of houses in the two squares are built at right angles to the river, and so arranged in parallel lines as to keep the vista to the river, and to the river garden and its trees, open every-

where; a very important point in making the most of a river-side site, and one that is often entirely overlooked. The method of building *along* the river bank is capital for the terrace which is next the river, but all the rest of the property loses the sight of the water, and the additional circulation of air altogether. The line of houses is turned crosswise across the site only at the further end, where the terrace serves as a barrier to close out the view of the less-desirable Pimlico neighbourhood.

In regard to the roads which form the southern and western boundaries of the site, there is something to be said as to their influence upon lines of communication. We have called the southern road Horseferry-road, occupying as it does in part the line of the road so named, because, though the name does not sound very dignified, it is a great pity to lose a name which (like "Mill Bank") embodies so much of the history of the former state of the locality. The existing Horseferry-road, however, only runs a part of the way on this site, and then turns up at an angle which would cross obliquely the western part of our Tufton-square, and runs nearly up to Victoria-street. This portion of Horseferry-road, therefore, disappears from recollection in our plan, and, apart from sentiment, perhaps the road we have shown might be more suitably called "Lambeth Bridge-road," just as the road from Victoria-station to the next bridge up the river is known as "Vauxhall Bridge-road," for we must observe that our scheme includes the proposal for what is much wanted, and would be still more wanted were any other parts of this plan to be carried out, viz.: a solid stone or iron bridge over the river at Lambeth in place of the light suspension-bridge which is there at present. Not only is such a bridge wanted for general purposes, as traffic between the two banks at that point is increasing very much, or rather would increase very much if it had the opportunity; but such a bridge would also, in conjunction with our new road of approach, afford an important shortening of the route into the City from Fulham and Brompton, as will be readily seen on looking at the map of London as a whole. Moreover, the road is here designed as affording a continuation of a main line of road which is at present abruptly cut short. The reader will see that our road leaves the plan on the left, with a slight dip southward, where we have placed the arrow with the words "to Fulham." If the direction here indicated be followed out on a general map of London, it will be seen that the road would cross the southern end of Victoria station, and if continued, would exactly join the line of the long "King's-road," which forms the main route into London from Fulham, but which is abruptly cut short at Sloane-square, after which point the passenger has to find his road by angles and byways. The difference between going to the City across Lambeth-bridge from this point and the present route, traversing the north side of the river, is, as will be seen on looking at the position of the abrupt bend of the river near Westminster, the difference between the chord and the arc.

But we must now ask the reader to look at the road which forms the western boundary of our new Square, and divides it from the Pimlico district, and which we have termed "St. James's-road." This follows the line of no road which at present exists, and the reason for its name will be at once perceived on tracing its course northwards. After joining the general meeting-point of the new roads in the centre of Victoria-street, it goes on past the end of Tothill-street, and cuts into Birdcage-walk at the point at which the carriage-way from Queen Anne's Gate at present does so. It then continues across St. James's Park, taking a slight bend westwards, and crossing the Park water by a bridge nearly on the site of the present small suspension bridge, the position of which is shown by the dotted lines a little to the left. If this line of road be continued beyond the point at which it quits our plan, it will be found to join the Mall exactly opposite Marlborough-road, so as to provide a direct line of communication between the new Westminster district and St. James's-street and Pall Mall. The want of such a communication is already much felt and complained of, and of course in connexion with such a plan as we have proposed it would be an absolute necessity. To do it thoroughly it would be necessary probably to sacrifice one small end house in the Queen Anne's Gate row, as the new houses west of the present gate into Birdcage-walk have been built so close up as to afford only room for a very narrow carriage-way; but otherwise there is no difficulty in the matter. The new bridge might be made an additional ornament to the park, and only a little give-and-take of levels would be required to get the roadway high enough not to interfere with promenaders by the Park water, who would in this case, perhaps with a little dip in the footwalk, pass under the bridge, in the same way as at the bridge over the Serpentine between Hyde Park and Kensington Gardens.

We have now come round nearly to the point whence we started in our survey, and must close our suggestions, hoping that they will not altogether fall to the ground. In regard to the two new routes, Lambeth Bridge and St. James's-road, we are convinced that these must be adopted before many years, if not sooner than that phrase would imply. We may notice that in addition to the road over St. James's Park, we have a road (marked E on plan) running obliquely from the Victoria-street centre, and connecting the new district directly with Buckingham Palace and Constitution-hill. We had, indeed, half indulged the "fearful joy" of a large boulevard direct from the west front of the Abbey to Buckingham Palace, forming an acute angle with Birdcage-walk, passing over the site of Queen Anne's Mansions, and getting rid of that *ruda indigestaque moles* at the cost of an adequate compensation. But, unfortunately, the sacred enclosure of the Wellington Barracks would bar further progress, so that chance must be abandoned. York-street would have to be cleared and rebuilt, though its line could not be materially altered; and perhaps some day we may hear of the Victoria Station preparing to put on an architectural countenance worthy of the importance of the terminus and of the neighbourhood, in place of the paltry sheds which are at present a discredit to the site.

There is one point in favour of the "Tufton-square" scheme we have omitted to mention: it would afford a "fashionable" square in a really interesting part of London, in immediate contiguity to what we have called the historic centre of London. There is certainly something in this, for perhaps no neighbourhood in London could be less interesting in respect of association than that in which the chief squares (socially speaking) are at present to be found.

A NEW LEGEND OF THE RHINE.

A NEW legend of the Rhine, scarcely less apocryphal than the famous legend of the Lurlei, and only by a few weeks of less antiquity, has been suggested to the imaginative Rheinlanders by the alarming earthquake of last August 26th, when it is believed by not a few that the unusual shock which visited this portion of the Rhine district may have been occasioned by the turning in his grave of the famous Cologne burgher Dickoff, of building notoriety, painfully grieved at the disastrous destruction, by fire, of his beloved creation, the Getrudenhof, which some years back he caused to be rebuilt, or rather restored. Poor burgher, his demolished creation is not the only fine work that has suffered (by restoration) in Cologne.

Recalling our first visit, just twenty-four years ago, we can remember no other city that we have since seen that has suffered more from the hands of the improver.

There is still, and, as we all know, there has been for centuries, the famous scaffolding of the unfinished Dom, adding a picturesqueness to the form which suggests to some minds that the completion of the spires may not prove thoroughly satisfactory, revealing as it does by its concealment beauties that the imagination is thus able to supply, leaving so much to charitable doubt, and allowing of the hope that the beauty which has existed so long in other parts of this gorgeous fabric may be successfully emulated in the completion.

In much, however, that has been recently done, emulation has been sadly absent, while the imitation strikingly manifests the danger that must be inseparable from the mere work of the copyist.

The northern portal still shows, injured as it is by time, but still most lovely, a number of figures almost in the perfection of art, while at its side, the central restored door is all but finished; it really is too much praise, which some are disposed to give it, when they say that the modern work, although claiming to be precisely in accord with the work of the past, is simply wanting in the spirit of by-gone days; the work in all cases is not by any means of the finest, and this may be easily detected by the expert in figure work, while architectural critics detect even greater errors in the exquisite lines that their noble science reveals to them.

In the recently added sacristy, the lean-to at the south side of the cathedral, the work of which is again said to be a thorough renewal of the old, the common-place character of the whole design appears to be of the very lowest order, as does that of the fountain at its base, and it is a question to our mind whether the addition of the most modern ways of gardening and bedding out plants around the cathedral adds in any degree to the beauty of the whole.

It is, it is true, a delightful feature to see the, by this time, quite antique office of the clerk of the works embowered in graceful ivy and creepers, carefully trained; but if this office stood alone, and the great cathedral in the midst of its piazza, as so many other great cathedrals of the world have stood for centuries, we should be better pleased with the effect.

As for the enormous quantity of modern stained glass which the religious and artistic enthusiasm of the last forty years has added, it is simply sad to think how much beautiful old work must have been destroyed to make way for highly-coloured and badly-conceived modern work, which must in time, and as we advance in artistic intelligence, give way for superior designs.

Everything seems to have been done at Cologne, in the immediate neighbourhood of the cathedral, to destroy as much as possible the religious and holy atmosphere that has environed the great monument until the present moment of exaggerated Continental travel; and if anything could add to the desecration that has taken place around this magnificent pile, certainly the utmost has been attempted by the engineers who have constructed the railway-bridge across the Rhine, and which brings one immediately on to the entrance of the cathedral.

Art and artists appear to have refused all alliance with the engineer, who has carried out his project with no other view, apparently, than to show his acquaintance with some of the most elementary principles of strength, and this bridge rivals in size, while it painfully clashes with, the excessive beauty and dreamt-of perfection of the cathedral now so nearly completed.

A wonderfully and powerfully expressed feeling leads the gorgeous Middle-Age pile to produce an impression which we in the present day seem incapable of rousing, while still more unable do we seem to be to effect any union, sentimental or otherwise, between the most modern of work, the iron bridge, and the work of completion, so different in its aims, of the cathedral. On the one hand we are met with a cold, staring, and straight-lined construction, built according to the correctest of technical principles; on the other, by a building of divine conception, which in its unending play of curves and lovely lines, in the wealth of art displayed in each portion of its entwined and entangled architecture, combines the laws of the strictest unity vivified by the breath of divine inspiration.

Materialism and idealism could not be more harshly contrasted than when one compares the iron bridge through whose construction one sees a crowd of men, locomotives, and wagons, as if in some gigantic rat-trap, and the calm, quiet cathedral separated from the bridge but by a few yards and yet seemingly descended as it were from some other world.

The iron bridge is so truly the production of the full-blooded materialism of the present day (alas! for the time-honoured and quaint old bridge of boats), and the cathedral is so thoroughly the creation of the Middle Ages, strong in its religious faith, and whose whole life was impressed with that doctrine of eternal and divine salvation, which more than one fervent artist has in modern times endeavoured to realise.

Should these criticisms on the Cologne suspension-bridge and the restoration of the famous Dom not appear to every one correct, it must be taken into consideration that they are made, not on the merit of the undertaking, but rather on the way in which it has been carried out, and suggested by the unsatisfactory appearance which the modern portions present to the appreciative eye. We slightly doubt the artistic capabilities of the Cologne architects and sculptors. An art city Cologne certainly is not. It

is no city of artists; but it is essentially a city of artistic work.

As an art city there exists a very natural rivalry between Cologne and the town from which we are at present writing; Dusseldorf is called an art-city and a city of artists, and yet Dusseldorf possesses none of those extraordinary treasures that are the property of the Cologne authorities; in the first place, in their unrivalled collection of their own early masters, and in the one Classic authority, the deservedly famous head of the Medusa, which is almost sufficient, one would think, to found a school of art. Yet judging by their exhibition of modern pictures, which is now open to the public, it would scarcely be ill-natured, it would simply be just, to say that they do not show at the present moment that they can have any claim to be considered, whatever they may have been in the past, an artistic community, while here in Dusseldorf, at least lingers still something more than mere traditions, and good work is yet done, notwithstanding the depressed commercial condition, and the withdrawal of the trade patronage which here killed the very life that the artists have worked so hard, but in so mercenary a spirit to uphold.

Dusseldorf.

THE BOULOGNE LIGHTHOUSES.

THE projected new Harbour of Navigation and Refuge at Boulogne promises to be one of the most splendid on any coast of France, notwithstanding some apparent paradoxes in the scheme of its construction. Its group of lighthouses, however, may be regarded as of even more general importance than the contemplated haven itself, because they will afford an infallible guide to the mariner exactly where he is most liable to mistake his way on the Channel waters. They are to be four in number, furnished with the most powerful lights, upon the best-known principles, and capable of casting a gleam at least of their radiance upon the opposite shore. No similar cluster, supposing this to be completed, exists in the world, the utmost hitherto attempted having been the establishment of two, generally at the extremities of an extended bay in which vessels were in the habit of taking shelter, or where the business of the sea was customarily carried on by night. But it by no means follows that the quartet of beacons at Boulogne will be without a parallel in point of number, different though the arrangement may be. There are no fewer than eleven illuminated signals of the first, second, and third class, flashing their rays upon the river approaches of the Gironde. At first these were no more than iron baskets of burning coal or wood, suspended on lofty poles; then, lamps were substituted, fed with coarse oil, and supplied with round or flat wicks; next, the inventions of Argand came into use, with Carcel following them, whose mechanisms, indeed, have not yet gone out of use, though greatly improved by the combinations of Arago and Fresnel, with whose names the history of the French lighthouse system will always be connected. The catoptric system, with which mirrors or reflectors were introduced, was an improvement, perhaps, though nearly parallel with, the dioptric, applied by Fresnel to his famous "tower" at Cordonan, almost in the very mouth of the Garonne. This was succeeded by a lighthouse at Mount Agda, on the Mediterranean coast, and another at Cape Bearn, visible to one another at a distance of more than seventy miles. At present, aided by peculiarities of apparatus, the lighthouses of the French coast are nearly all illuminated with colza oil, though the electric element is expected to displace it in lanterns of the first order, and at the greater height. Petroleum was used, in several instances, with no great success, as at St. Gaubain. But it will be less with the kindling power than with the durability of the edifices constructed by them that the marine architects of Boulogne may be expected to principally concern themselves. The building of a lighthouse may necessitate many and different conditions. It may be undertaken on the summit of a mountain, as at Cape Bearn, near Port Vendres, or on the height of a cliff, as at L'Ailly, Fécamp, and La Heve, on the Norman coast; or it may have its foundations laid in deep water. Moreover, it must, naturally or artificially, be stationed at a commanding elevation above the sea-level, both because it may be seen from afar, and also that no trees, houses, or even sails of ships, may intercept its friendly signals. The loftiest structure of this class on the French coast, at present, is that of Cordonan, more than 200 ft., or about the height of the towers of Notre Dame, and followed by those of Dunkirk, Calais, and Baleines, on the western extremity of the Isle of Ré. Frequently, however, the walls have to be carried up from rocks, or groups of rocks, continually beaten over by the sea, as at the Eddystone, though few of these incidents will occur at Boulogne, where they will stand upon, or rather rise out of, an artificial breakwater, not destined, it may be hoped, to the doom to which that of L'Ailly, one of the great lights on the Norman coast, is inevitably condemned. Erected on a chalk cliff, it is already nearer to the sea, by one half of the distance, than when its foundations were originally laid, and the day must come, in spite of sea-walls and buttresses, when it will topple over, and mingle with the wrecks it was destined to prevent. Perhaps, however, the most remarkable among French lighthouses now existing is that already referred to, of Cordonan, at the mouth of the Gironde, built towards the close of the sixteenth century. Originally, it was not much more than half its present height, which is calculated from the level of the highest possible tide. Among its singularities is that, while the exterior suggests the idea of a fortress, the interior recalls that of a palace, elaborately sculptured and adorned. Isolated in the midst of the waters, it has, nevertheless, far above them a vast platform, on which the habitations of the assistant-keepers stand in comparative safety. Somewhat similar is the position of the great Pharos of Henri de Brebat, on the Brittany coast, reared upon a huge porphyry rock, formerly the sailors' terror, commenced in 1836 and completed in 1839, in defiance of extraordinary difficulties, occasioned by the violence of the tides acting upon a multitude of formidable shoals and reefs. It was here necessary, not merely to construct an edifice, but also to hew out or blast a little port among the rocks, where the craft employed by the constructors might lie in safety. As the slim though solid tower grew up, every course of masonry was, twice a day, covered by the waves, until a certain elevation had been reached; being thus bestrewn with slime and sea-weed which, as will be well understood, were no facilities to the builder. Sixty workmen, however, under the direction of the engineers, performed their tasks so well that their platform has scarcely ever since needed a repair. They squared, grooved, and dovetailed every separate block, employing cement which, as they declared, and as it seemed, acquired in a few hours the durability of stone; but whatever the truth in that respect, the result has justified their confidence. Since that period, however, French lighthouse architects have unfortunately been content with foundations of less Roman solidity; and the lighthouses themselves have been constructed of less massive materials. In fact, the manufacture of these edifices in iron for trans-oceanic ports has become almost a distinct branch of French industry, and some of the perilous points on the French coast itself have been thus supplied,—as at Pontaillac, near Royan, which indicates an entrance, amid thick-set sand-banks to the Gironde; and at Walde, which points out a dangerous stretch of the same obstructions, fronting the port of Calais, which, scarcely less than Boulogne, requires a new port, a new pier, and a new set of warnings to navigators.

The French side of the Channel, indeed, has hitherto been singularly deficient in its supply of these structures, so essential to any thickly-crowded coast. Up to the present time there have been three lights visible at English ports,—those of Dunkirk, Calais, and Cape Grisnez. Between the first two are two others, belonging to the second rank,—at Gravelines and at Walde. At Étaples, at L'Ailly, at Fécamp, and at La Heve, the three great Norman ports are signalised; but hardly anything has hitherto been done, in this direction, for Boulogne, notwithstanding that it is, after all, the principal English gateway to the Continent. Harfleur and La Hague, the mouths of the Loire, Triagoz, and Tremorvan, Finisterre—the guiding-mark of Brest, Belle-Isle, L'Orient, and Chapiron,—had their lighthouses; but only one, on Cape Grisnez, belonging to Calais, however, assisted the Channel pilot on his way across the most popular of the Channel passages.

The Mediterranean coast of France, it may be remarked, is singularly free from embarrassments to the navigator. Seven lighthouses of the first order, and a few inferior beacons suffice for the whole; one of the former, in fact, and four of the latter, for the immense and teeming port of Marseilles. Six, with a few secondary lights, are given to the entire circuit of Corsica, while the Algerian harbours are scarcely lighted at all. On certain parts of the French shores, the inhabitants have contrived rude day-signals for ships by building lofty walls, of an intense white, or peculiar shape, or monumental piles, as on "the Isle of Antioch," or towers with windmill tops, as on the Isle of Oleron. But these, with bells, whistles, trumpets, and gongs, all put together, do not by any means compensate for the absence of a lighthouse, adapted to modern scientific principles. As an illustration, it was impossible a few years ago to enter the great port of Brest by night, whatever pilots might be employed; but now, two small illuminated towers indicate the practicable channel. The French compute the cost of these edifices, in the mere building, at from 8,000*l.* to 25,000*l.* upon an average. But what hitherto have been the sea-signals available for Boulogne, by night or by day? The Lower Jetty, on the north-east, with a flagstaff and a bell, to the south of the old port, announcing the depth of water in the passage, and the state of the weather, whether misty or not, the hammers striking about once in a second. Then, there were the bells of Ambleteuse and Bazinghelle; the Fort de Croï, with its ramparts by day and its lanterns after dark; the lofty monument raised in honour of the Grand Army, Fort l'Heurt; and the little lighthouse of Alprede. This was positively all, with hundreds of thousands of passengers entering the harbour, year after year. Calais was slightly better provided for, with its Bank of Quenses, Barrier of the Line, beacon at Walde, tower, mills, belfry, and lighthouse, already referred to on Cape Grisnez, besides two or three signal-masts, hoisting "osier balloons," which, of course, are only useful by day, and that only when the light is perfectly clear. It is interesting, however, to note now that so much attention has been attracted by the Boulogne project, that about the middle of the seventeenth century there was near the existing jetty a lighthouse of Roman construction, reputed to have been erected by Caligula, when upon his expedition against the Gauls. Montfaucon affirms that it succumbed in 1644, in consequence of the cliffs below giving way, and he supplies the design of the building, which has every appearance of authenticity. The ground-plan of this tower was octagonal, and the tower itself was composed of twelve stories, diminishing, like those of a Chinese pagoda, each by a step, as they rose one above another, and each also having a broad cornice, constituting a sort of gallery, like that of the more famous, but kindred, building at Alexandria. Each of the eight sides was 25 ft. in width; but with reference to the height, concerning which no exact details remain, it is calculated that if the measurements of Montfaucon were estimated with any approach to accuracy, it must have approached to that of the structure at Cordonan, or slightly over 200 ft. The walls were carried up in irregular courses, following, however, a systematic plan; to three layers of Boulogne greystone succeeded two layers of a stone softer in substance, and in colour yellow; then two layers of immense dark red bricks, followed by the grey stone, and so forth to the end. This lighthouse would appear to have been restored by Charlemagne, who, rekindled the beacon-fires which his barbarian predecessors had permitted to die out; but, after his epoch, it was abandoned, in what particular period is not known. Curiously enough, however, as M. Reynaud points out, in his exhaustive work, in quarto and folio, upon the whole subject, there have been discovered near Dover the remains of a tower, built apparently upon the same lines with that at Boulogne, evidently designed to answer the same purpose, and, moreover, so far as may be ascertained, belonging to the same period. The architects of Boulogne, therefore, may, in some measure, take unto themselves the credit of reviving a Roman work. The longevity of some among these structures has been remarkable, notwithstanding the furious weather to which their inevitable elevation and the very purposes they serve expose them. That of Genoa, lofty as it is, dates from early in the sixteenth century; and many others, still in use, are equally ancient. France, when the four lamps of Boulogne are kindled, will possess fifty of these beacons, of the first-class, altogether.

M. Reynaud, the most eminent authority upon this topic, perhaps, discusses practically the different shapes to be recommended,—round, square, or octagonal, the various elevations necessary at different positions, the comparative solidity of foundations, and the most convenient modes of exit and egress. It is clear that this variety of architecture, differing essentially as it must, of course, do, is a matter of characteristic importance for communities which have the ingoings and outgoings of their commerce carried on through stormy approaches to ports which are worth rendering safe at any cost, so that the progress of the works at Boulogne, little as any of it may be visible for a considerable time to come, will be watched with peculiar interest.

ARCHITECTURE IN THE PARIS EXHIBITION GARDENS, ACCORDING TO M. CHARLES BLANC.

THE articles which have appeared from time to time in the *Temps* detailing M. Charles Blanc's theories on architecture, as demonstrated at the Paris Exhibition, have excited so much interest and been so keenly appreciated that we need not apologise for again referring to them.

On a previous occasion we gave a synopsis of M. Charles Blanc's criticisms on the Avenue of Nations; now we have before us an interesting paper on some of the various typical structures which embellish the gardens of the Trocadéro and the Champs de Mars.

Mr. Charles Blanc opens his criticisms by acknowledging that though sentiment ought and actually does exercise great influence on architecture, nevertheless the more we study the question the more readily do we recognise the effect of climate on men's minds and the works of their imagination. After all, the thoughts and beliefs of a people really originate in the air they breathe, the latitude they inhabit, the mildness or severity of the climate. These are the causes which form the national temperament and create a predisposition in favour of this or that school of belief. Indeed, to these considerations we may safely add that, should the dream of a universal religion be ever realised, the expressions given to this religion would still differ in accordance with climatic influence. Each people would adopt and emphasise that phase of the common religion which harmonised best with their natural disposition, and this tendency, based, in the origin, on race and climate, would undoubtedly be illustrated by the architecture of the various nationalities.

To return to M. Charles Blanc, the structure raised in the Trocadéro Garden by the care of the Egyptian Government, is, he maintains, a striking proof of climatic influence. In a country where intense heat weighs down on the populations, where the sky but rarely changes, where the temperature is permanently oppressive, and the inhabited districts are surrounded by appalling deserts, ideas become fixed, beliefs immutable, customs are perpetually maintained, and generations succeed and resemble each other. Under such circumstances, it is easy for men of superior intelligence, and capable of gaining the respect of the crowd, to establish a religion which shall live, if not for ever, at least for centuries upon centuries; but all such sacerdotal domination envelopes itself in enigma, hides itself under symbols, and will not allow itself to be approached or understood by the profane or the vulgar.

Let us look, therefore, at the imitation of an Egyptian temple, such as it may be seen at the Exhibition. The architecture is formidable. It consists of high walls which exclude all light from the outside, unless we take into consideration small openings pierced high up, far above the inquisitive gaze of those who pass. This temple, carefully closed on all sides, has but one entrance; it is the impenetrable abode of the divinity and his priests. In appearance, the temple is imposing, especially on the mind of the masses; it suggests internal galleries with abundant air and shade and obscure sanctuaries. The architecture seems to indicate thoughts which shall not be revealed to the multitude. An eloquent mystery is the very condition of its existence.

Let Egypt, however, be conquered by the Arabs, and immediately the genius of the Semitic races will modify the architecture by imprinting upon it the trace of their customs, which were instituted on another soil and under the influence of another climate. The nomadic life of the Arab has given him the love of change. What was grave, monotonous, immovable in Egypt, becomes, under the Mussulman domination, enlivened, expressive of movement, and relieved by alternations. The surfaces, which were flat and plain, will be carved, engraved, embossed, and even pierced so that here and there a slight draught is created. There is a sense of activity, change, and movement engendered. The base is alternately yellow or brown; the dressings in white stone or red brick. The openings in the walls are precisely what we should imagine a polygamous people seeking to imprison their women in harems would desire. These are windows carefully closed by delicate trellis-work, which does not hinder the inmates from looking out, but prevents any one looking in.

If we wish to have a correct idea of the religious architecture of the Mussulman of ancient Mauritania, M. Blanc recommends the model of a mosque built by a young architect, M. Charles Wable, at the foot of the slope in the space consecrated to Algeria. This mosque is a free imitation of the building admired by all travellers at Tlemsen. It is remarkable by its proportions, and the contrast between the nudity of its exterior walls and the rich ornamentation covering the interior surfaces of the monument. After describing this building, M. Blanc remarks that the exterior door of this temple is covered with pottery work, and the gemell-windows are surmounted by a rectangular framework, which the English imitated in their Tudor style of architecture. A curious point to be noted, illustrating how architecture expresses ideas, principles, and doctrines, is the fact that all the small Algerian constructions at the Trocadéro possess extending roofs or verandahs, thus offering shelter or shade to those who are outside. The temple is the only exception to this rule. This clearly proves that the awning, so useful in places where people assemble,—the bazaar, the public fountain, &c.—is not considered proper for a mosque. A mosque was not intended to afford external shelter to the faithful: it is their duty to enter the house of God, and seek internal consolation. If the temple is approached at all, it should be for the purpose of worship, and not merely to avoid a shower of rain, or to escape the searching rays of the sun. It should also be noticed that the temple is covered with loopholes, and has been built with a view of resisting invasion; it seems to relate how the town of Tlemsen was besieged by the Moors from Fez, and that the inhabitants of Algeria had to defend themselves against these incursions for about a century.

Travelling, by the force of conquest, through the different countries of Asia and Africa, the architecture of Islam was modified principally in accordance with the respect which the conquerors could not but bestow on the monuments of an anterior civilisation, and by the nature of the materials found in the conquered countries. When it was imported into Persia, the Arabian style became what the ancient Persian architecture had been,—merely the art of decoration. The same Arabs who had raised at Cairo colossal monuments, and notably the mosque of the Sultan Hassan, because the necessary raw materials were ready at hand, built in Persia edifices composed of small stones, covered with plaster and hardware, hiding the form under a mass of decorative art. The miniature palace which the Shah of Persia caused to be built at his own expense in the Trocadéro Gardens, between the Chinese bazaar and the Tunisian *café*, is a model of one of his own residences in Persia, and a striking example of this theory. M. Blanc estimates that some ten million visitors will gaze on this little palace, which might be called in Paris, as in Persia, the Palace of Mirrors. But those who have not entered the principal room, where the Shah is presumed to rest, will have formed but an incomplete idea of this peculiar style. The vaulted ceiling is covered with small pieces of glass, presenting innumerable surfaces. Eleven hundred thousand little pieces of glass have been employed to ornament this ceiling. The Persian carpets are reflected in the prismatic surfaces of the cupola. The furniture, covered with shells, produces on the myriad of reflectors the most irregular effects, the diamond or crystalline shape of the glass increasing the glitter and sparkle. The windows, also, are of stained glass, and the frames painted with brilliant colours; finally, rays of light fall from the summit of the cupola, and strike violently against some red globes; the whole presenting a spectacle of light without shade, colorisation without end or rest, increasing sparkle and reflection, utterly dazzling to the unprepared visitor. The Shahs of Persia must attach marvellous importance to their persons, to their image, to the slightest change of their countenance, the most insignificant movements of their life, to have thus desired that their every action should be reflected a hundred thousand times over on the walls of their dwellings. What would a Greek philosopher have thought of this mad prodigality of mirrors, of this puerile luxury and barbaric taste?

The Shah was not, however, content with this single example of the minute in decorative work. The other rooms of the miniature palace were to have their walls covered with Persian pottery, imitating in colour the numerous and wonderful shades of Indian shawls; but, fortune, in alliance with good taste, sent a storm which so shook the ship conveying the porcelain to Marseilles, that it was all broken to atoms. Instead of the shining enamelled porcelain we have only paper, which, however, was manufactured on purpose in Paris, and designed to imitate the wrecked wares from Persia.

The bazaar constructed by order of the Bey of Tunis, the *café* opened by the exhibitors from Morocco, all bear the characteristic marks of Arabian architecture, with the modifications denoting sojourn in Western Africa or in Spain. M. Charles Blanc denounces here the grievance we have already mentioned. He complains of the questionable Armenians, the false Orientals, who disturb every visitor by their efforts to sell pastiles, Turkish pipes, and other trifles, which can, not only be bought, but even manufactured, in any part of Europe. In fact, it is only necessary to cross the Champs de Mars, and, in the great gallery that runs parallel with the École Militaire, a number of French women may be seen daily employed making, painting, enamelling, &c., Turkish pipes, and similar articles, which others sell as coming direct from Constantinople.

M. Charles Blanc is particularly impressed by the contrast between the Persians and the Japanese,—the first deeming that life without a profusion of looking-glasses is not worth living; the latter, on the contrary, being content with an old-fashioned metallic mirror,—and, as he suggests, recalling the verses from the "Orientales,"—

> "Les vierges au seins d'ébène,
> Belles comme les beaux soirs,
> Riaient de se voir à peine
> Dans le cuivre des miroires."

The little model house, made with materials brought expressly from Nippo, does not possess a single pane of glass or of looking-glass. The Japanese close their windows with rice-paper, so prepared that the rain slides off, and it remains impermeable. All is organised with intelligence and simplicity; but the Japanese cultivator and merchant, the artisan and the clerk, seem, one and all, thoroughly impressed with the inherent instability of things human. There is nothing permanent in their home. All is built with a view to sudden change, excepting, perhaps, the little rice-straw padded mat, about 1 in. thick, which serves as a mattress at night, as a table for meals in the day, as a carpet for the children's bare feet, as a lounge where the parents sit on their heels, drink tea without sugar from lacquered cups, or discuss over hot rice wine, or *saki*, served in vitrified enamelled porcelain, which seems like unpolished glass. A whatnot or cheffonier and a few folding screens constitute the rest of the furniture of a modest dwelling, and here all changes, all is transformed according to the requirements of the moment. By means of movable partitions and sliding sashes the small rooms are converted into a large room, or the large room into small compartments. At night the drawing-room is split up into bedrooms. In the morning, the bedrooms, well aired, are changed into shops. The outer wall is removed; the floor, which is built some 2 ft. from the ground, forms the counter, on which the goods for sale are laid out. An open space above the framework, protected by bamboo trellis, admits the air both day and night, and insures good ventilation. All these results are attained with bamboo, and bamboo alone. It is slit bamboo which serves as tiles for the roof; a larger slit bamboo is used as a half-pipe, to carry away the rainwater. Finally vegetable string is employed for palisade-work, and will resist the effects of the atmosphere. Here and there, in the garden, huge umbrellas protect tender plants and the gardener who cultivates them.

M. Blanc then continues to dilate on the extended range of architecture, which is no longer content to build houses and monuments, but seeks to imitate the accidents of nature by creating a waterfall in the Bois de Boulogne, and digs into the slope of the Trocadéro to introduce a grotto with reservoirs of water, where the fish of the aquarium disport themselves. The building, in civilised and over-populated centres, imitations of wild and unfrequented scenery, is, indeed, a new but now a common diversion from the architect's ordinary scope of work. In this strange structure subaquatic dramas may be witnessed; for, despite the Society for the Prevention of Cruelty to Animals, little fish have been placed within reach of big fish, so that the latter may fatten on the former; while the public can contemplate at ease, and even envy these animals, who have the reputation of leading happy lives, and who, in any case, have nothing to do but to live peaceably, and have no other fear save that of not finding any small fish to eat, or of being themselves devoured by larger fish. To them the claims of the rival schools of art, the competitions of commerce and industry, remain matters of supreme indifference!

SCULPTURE IN THE HOUSE.

UPON an impartial survey of the state of the arts in England, it is impossible to consider that sculpture is either flourishing or popular. It might possibly be said, indeed, that an art if it is flourishing is necessarily popular, but that position will, upon further consideration, be found to be unsound, since it is obvious that if two or three sculptors such as Flaxman and Thorwaldsen were in the zenith of their power sculpture might be considered as flourishing, even if the productions of the sculptor's chisel did not attract the attention of the world at large.

But it is obvious that one of the chief reasons at the present day why sculpture is not a calling upon which artists eagerly enter is because there is, speaking generally, no market for it. We are, of course, aware that certain public statues to statesmen or philanthropists are annually erected, that a certain number of persons desire to have the busts of certain of their relatives or friends represented in marble, and that there are a few men possessing æsthetic tastes and large rooms who will purchase statuary. But when all is said and done the amount of demand for works by sculptors from these three sources is most small, and when it is compared to that for paintings and drawings it is absolutely infinitesimal. Nor to counterbalance this want of demand is the calling of the sculptor regarded by the world as the high and honourable, it may be even said almost sacred, office which it was in times gone by. The ancient Greek regarded Myron or Phidias with the reverential awe which is generally reserved for the great benefactors of their country, and a Mediæval pope,—the most proud of prelates and potentates,—would obsequiously desire Michelangelo to execute for him a commission. Such a position might compensate even in these days for a want of clients, but when even it does not now exist it is not wonderful that from this and other causes sculpture does not flourish. Yet it is obvious that for the benefit of the world at large the taste for sculpture should be as largely developed as possible, and that the desire to possess it should be made as keen and as available as possible. Indeed, in an age when simplicity of life, and of taste, is somewhat at a discount, the influence of sculpture, at once so pure and beautiful, should be cultivated as far as possible.

Whether, therefore, sculpture be regarded from the point of view of the interests of the artists or from the higher standpoint of that of art generally, it is clear its encouragement in the house is most desirable. The finest public galleries are, after all, only the places to which the national taste should look for its leading examples, and it is in the home that some of the most valuable results of art must be produced, and fostered, too, by the careful collection of works of art, not so high a kind, it may be, as will be found in the public galleries, but yet truthful and solid. And those houses may be of a twofold kind. They may consist of those stately houses of England, many of which already, such as Chatsworth and Eaton, possess very noble works of art, or of those newer and equally magnificent mansions erected within recent years; or secondly, of those smaller houses in town and country, where plenty, if not profusion, reigns, and where there is space without vastness. The owners of both kinds can do, and should do, and in some cases now do, all that is possible to encourage sculpture; but the encouragement it meets with is, in fact, very small. The number of houses where sculpture is really cultivated may be counted, we venture to assert, almost on the fingers of two hands; for where there is a house in the country which is of any importance, there should belong to it a sculpture-gallery; for, in those cases where it is possible sculpture should, so far as practicable, be exhibited in a room fitted for the purpose. For it is of the utmost importance that the light from above, and the colour and form of the background should be carefully attended to, in order that the works of the sculptor may be seen to the best advantage. The idea of a sculpture-gallery sounds at first possibly too confusing; but a gallery is, after all, only a room, and a room may be of any size you please. Consider for a moment the care which now-a-days is given in every house of any size to the billiard-room. How carefully the dome lights are considered, and how, when the architect is instructed to make plans for a new house, the billiard-room is a matter of the first consideration. The statue gallery needs little more attention than the billiard-room; it should be lofty, well lighted from above, and the walls should be painted or draped with some colour suitable for the proper display of works of art, though some little care is requisite in this particular both as regards colour and extent if bas-reliefs are introduced into the walls. We have at this moment in our mind a very excellent example of the feasibility and the attractions of such a gallery. The house is one erected under the high architectural skill and knowledge of the late Sir Gilbert Scott. It is a large, a roomy, and an essentially comfortable house, but it is not a palace, and there are numberless houses scattered throughout England much larger and more magnificent. It stands upon a terrace; the suite of entertaining-rooms looks out over the bright flower-beds and the varied tints of the wood, the spire of the village church, and the hills, rising up behind. First there is the dining-room, which opens into the library; this in its turn opens into the drawing-room. Then comes a high sliding door, which gives access into a short recess, or rather archway, 6 ft. or 8 ft. long, and which forms the entrance to a circular sculpture-gallery. It is not a large room,—smaller, indeed, than any of the three we have mentioned,—but it forms at once a home for sculpture, and adds to the beauty of the other rooms, since, when the door is thrown open, it forms a very striking outlet to the drawing-room, adding much to the attraction of this room. The ceiling is of wood, the walls are of a light pink colour, and the floor is also polished wood. Here, in all its tranquil beauty, may be seen Gibson's most successful and most graceful work, the "Aurora," passing with light feet over the morning sea; the more masculine form of his "Hunter and Dog"; and some other noticeable modern works.

We have gone into this example because it is one which could not be more apt for our purpose. Here among the Welsh hills is a comfortable English home, but here is also a small sculpture gallery which adds at once to the attractions of the house as such, affords opportunities for pleasant contemplation, enables the work of the sculptor to be regarded quietly and thoughtfully, and must, therefore, be the means of enlarging and cultivating a knowledge and appreciation of art. There is no more powerful influence upon the young than association. A young man of merely ordinary abilities, if brought up in the society of those who take an intelligent interest in politics, who from his earliest youth has been accustomed to hear political subjects small and great discussed with vivacity and thoughtfulness, insensibly draws them into his scheme of life, and is almost sure, till the day of his death, to take a more intelligent and more casual interest in national matters than if he had not had this early advantage. It is just the same in regard to art. Given a sculpture gallery, there is certain to be some continuing interest in the progress of sculpture in that family. The history and the lives of sculptors from a subject of conversation and research from time to time, and the great works of antiquity necessarily come in for their share of attention. Hence the mind becomes more cultured; a taste for sculpture or for works of art generally may be sometimes vigorously fostered; in some cases what may be termed an intelligent interest only in artistic matters will be aroused. But in either case the profession of the sculptor has been raised in the estimation of some of the public; the minds of some men have been more or less cultivated, the possibility of the spread of art is enlarged, and the probability of a larger demand for the works of the sculptor is also produced.

So much for galleries, but there may be houses where it is not possible, for various reasons, to erect galleries. In such cases a lofty room may be utilised; in others, a hall may be adorned with bas-reliefs or with statues in the round. In any case, the hall, if no other room is available to be set aside for sculpture, is the most fitting place, because there is a simplicity and a soberness about it which suits well with the character of sculpture. For certain kinds of sculpture the library is a very fitting place. M. Thiers, as we know, regarded as his most precious ornaments the bronze duplicate of Michelangelo's "Nursing Madonna." Copies, too, of classical works, either of busts or of ideal works, reduced in size, may often be well and properly housed in the library. Indeed, of this we may cite for an example the library of M. Thiers, as we have already taken the gallery of an English country-house for an example of the possibility and advantages of galleries of sculpture in the house. It would be interesting to describe the paintings and drawings which adorned the rooms of the illustrious statesman, but we must rest satisfied with noticing only those things which directly concern this paper. "M. Thiers made few hard-and-fast rules in his life. One of the few was not to give house-room to any but first-rate articles of *virtu*. . . . . He bought from the Salviati family the bronze duplicate of the marble [the 'Nursing Madonna'] which was given by Michelangelo to Salviati, Bishop of Florence. The doors of the library were kept by an Apollo, and a Satyr, copied from the antique. 'The Last Judgment' was flanked by reductions of the Farnese 'Hercules' and the 'Slave' of Michelangelo. Bronzes, copied for M. Thiers from the tomb of Lorenzo de Medici, were stolen from the Garde Meuble, where Fontaine, the Communist, placed them. Other copies in marble were since done, but somehow they did not speak to M. Thiers the same language as the lost ones. 'Day and Night' and 'Dawn and Dusk' were recovered, and stood at the corners of the library. A common sentiment,—that of intense grief,—agitates them. Between two of them was placed an alto-relievo in terra cotta of an entombment, also by Michelangelo."* And these works of art became very dear to the statesman, and were always a solace. Thus, as he said himself, "when I find myself in a flat country, I shut my eyes, and evolve the statues of Michelangelo."

The drawing-room is the last place where, as a rule, we would place sculpture, though, if care be taken, there are some rooms which, by their formation, may be fitted for a statue or a bas-relief. But as a rule a statue in all its beautiful simplicity looks out of place among the thousand and one odds and ends of a modern drawing-room, though, as we have said, if some suitable recess or corner can be provided and properly prepared, a statue may be fitly placed in a drawing-room. But a statue does not tend towards the *general* embellishment of a room: it must be regarded for its own beauty alone, and it will not permit itself to be made a part of the furniture, so to say, of a room. It must be admired for its own sake or not at all. But small bronze or marble works may often be introduced with good effect into a room, though they, too, should be carefully placed with a full regard to the character of the art. How often do we see John of Bologna's, vigorous "Mercury," among a mass of ormulu, possibly backed by a picture of Birket Foster's, or an engraving after Sir Edwin Landseer. But if care were taken in this respect, and if modern sculptors would endeavour to popularise the taste for sculpture by the introduction of copies of the antique, would seek to do work in small pieces in the round or in moderate sized bas-reliefs, it would largely tend to the improvement of the state of sculpture in England. There is not a room in any house in England in which such works as Flaxman's diploma bas-relief in the Royal Academy would not be welcomed, and Gibson's "Christ Blessing the Little Children" is also one which may be cited as a similar but yet a

* "M. Thiers: a Sketch from Life, by an English Pencil." By Emily Crawford. *Macmillan's Magazine*, November 1877.

differing example. These things alone will not popularise sculpture, but it is clear that if those who can were to adorn their houses by sculpture-galleries, if the proper use of sculpture in houses were continually inculcated, and if young sculptors were to endeavour to work especially at bas-reliefs, and at small works in the round, there would be more chance of sculpture becoming a popular art, and consequently of sculptors being more appreciated and more encouraged. There are no doubt times and nations among which sculpture is more likely to flourish than in other days and among other peoples, and this country and this century are not on the whole favourable to this tranquil art. But with the spendid example of Flaxman before our eyes, it is impossible to say that great artists in this branch cannot spring up in these latter days. True, Flaxman had all the devotion to his profession, all the simplicity of life and mind, and all the carelessness for the opinion of the world, which was characteristic of the great artists of old, but yet his example is capable of being followed; and if those who can will encourage the introduction of sculpture into the house, we are more likely to see future Flaxmans arise in English art.

OLD RAMPARTS AND NEW BREATHING GROUNDS: FRANKFORT.

THE German military engineers of the Mediæval and later periods could have had no idea of the benefit their plans for the fortification of cities would prove to future generations of dwellers in German cities. Their only thought was to devise and carry out cunning plans for securing the safety of the towns from sack and pillage; and so they encircled them with thick, high walls and deep ditches, the double girdle being strengthened here and there by lofty castellated towers. It never entered into their remotest imaginations that in after-days these very plans would prove the salvation of those cities from other and perhaps worse evils than even pillage and bloodshed, namely, from disease and sufferings worse than death. Those were days of disorder and insecurity, and the first duty of civil life was self-preservation in view of the constant danger to life and property, from the unsettled state of the times. The necessary security could only be gained by the means adopted; that is, by surrounding the city with as impregnable a circumvallation as possible. The risks to which modern civic life is exposed were not present with them, or, at least, they were not conscious of them to the same extent which we are. Populations were not so large; overcrowding, except in war time, was probably not so great; and so the evils of insanitation were not so rampant. Besides, when plagues and pests did not break out with decimating fury, they were regarded as being in some way spiritual retributions, to be averted by prayer and penance. They had not yet learned to regard them as evidences of the violation of natural laws, as we have, and so they could not be expected to make provisions against them.

With the passing away of the times of constant war and bloodshed, and with the inauguration of a happier era, the need of these girdles of stone, with their watchmen on tower and rampart, no longer existed, and those whom business or pleasure prompted could transfer their abodes from the narrow street or narrower court to the open country beyond the walls, without fear of molestation by robber or other. But with the extension of the city beyond its former bounds, and the rapid growth of populations consequent on times of peace, came the other danger of insanitation as it had not presented itself before. It was no longer easy for the tired worker to find fresh air and relaxation without the city, the distance being too great, and the temptations inside too many; added to which, the citizen was no longer compelled to repair at certain times to some meadow outside the gates, and exercise himself in the arts of war. Then it was that the means of defence against a human foe proved of inestimable advantage under altered circumstances. No longer required for military purposes, ramparts, bastions, and towers could be toppled into the dry and grass-grown moats, and a smiling garden take the place of frowning battlements.

This is what took place in scores of German towns. Where once stood the ancient wall, with its adjuncts of ditch and glacis, now run beautiful wide promenades, in most cases extending quite round the city: a vast circle of park, with ornamental waters, walks, shady by-paths, arbours, seats, even heaps of sand, for the little lovers of dirt to roll and revel in. Fancy the Metropolitan Board putting cartloads of sand on the Embankment, or in the squares, for the children to dig and spade in! As instances of towns possessing these promenades, we may mention Hamburg, Bremen, Frankfort, Wurtzburg, Cassel, Mannheim, and a score others, not to forget Vienna, whose magnificent Ringstrasse, with its grand mansions and public buildings, extending in a wide semicircle around the inner city, stands on the ground formerly occupied by the fortifications. The completion of this latter work is of comparatively recent date. The Wurzburg promenades date but from the eventful year 1866, and cannot therefore compare in beauty with some older ones, but in the course of a few years they will be attractive enough. In this article, however, we propose to give you some idea of the promenades of Frankfort, and to show how enjoyable a public resort has sprung up on the old city battle-ground. The town stands on the north bank of the Maine, here a broad, rapidly-flowing stream. The old fortification consequently formed an arc, with the river as a base. When, about the beginning of the century, it was resolved to raze the wall, the city authorities had the good sense to listen to Burgomaster Guiollet's suggestion, that the space thus obtained should be kept for the public, and laid out in promenades. It was accordingly levelled and planted with trees, now monarchs in their way, the home of numberless birds, that make the evenings and mornings resonant with their songs. Never was there such a *rus in urbis*; and the city fathers who gave their town such a cincture deserve not only the thanks of their fellow-townsmen, but of their fellow-men throughout the world for setting such an example,—one it were well if all towns would emulate so far as possible.

The Frankfort promenades extend from the river Maine, near the public library, about two miles in a semicircle, and reach the river again some mile lower down, there joining other promenades stretching along the river side. A more delightful walk could not well be imagined for the early morning or the cool of the evening. Even in the heat of noonday there is grateful shade beneath the magnificently-spreading trees. The path varies at every turn: here we have beautiful groups of trees, there a mass of blossoming shrubs; now a neatly laid-out and fragrant bed of flowers, and now a well-kept grass-plot; then we come, perhaps, on a portion of the old moat, or are surprised by a glimpse through the trees of an antiquated tower, to which cling ivy and legend and poetry, if nothing more. Further on we are tempted to tarry and watch the foraging operations of a number of waterfowl on an ornamental sheet of water, or to listen to the cooling splash of a fountain. Everywhere art vies with nature to produce the most effective and delightful pictures. On either hand aristocratic mansions and snug villas, surrounded by all that wealth can supply, lend a finish to the scene. Such is the rendezvous and promenade of the Frankforters, especially in the evening and on Sunday afternoons. Rich and poor there meet, sit on the same forms, admire the same beauties, take their refreshment at the same *cafés*, and enjoy the same fresh fragrant breeze. Mrs. Jameson, speaking of these "Anlagen," as the Germans call them, says:—"One of the most delightful peculiarities of Frankfort, one that most struck my fancy, is the public garden, planted on the site of the ramparts; a girdle of verdure and shade, of trees and flowers circling the whole city, accessible to all and on every side,—the promenade of the rich, the solace of the poor." It is a delightful drive all round, but it is more charming as a walk, since on foot one can take time to examine the multifarious objects of interest that attract the eye,—the busts and statuettes, the many relics of the past, the wooden birds' nests in the trees, and the birds that hop about and pick food almost at our feet, so unmolested and consequently so tame are they.

This belt of gardens was laid out, as already stated, at the beginning of the present century, under the direction or Burgomaster Guiollet (who is generally considered to be their creator), and have from time to time received additional embellishments. Perhaps the reader would like to accompany us on a walk round the city, which will occupy, may be, about three quarters of an hour. It will be an entertaining and instructive walk, and may introduce us to a little Frankfort history, and a few Frankfort worthies. We start at the lower point where the promenade touches the river, and one of the first places we pass is the Rhine railway depôt. A little beyond we come upon a bust of Bacchus over a pump, much resorted to for the supposed medicinal virtues of its waters. Beneath it is the following inscription:—

> "Blessed the drink to us shall be;
> The water to you, the wine to me!"

Proceeding a little further, we come to the Bockenheimer Anlage, by the gate of that name, one of the principal thoroughfares to and from the town. Here, on a small mound, in the centre of a cluster of trees, is a monument to Guiollet, by Von der Launitz. The pedestal bears some fine figures in high relief representing the destruction of the old fortifications, and the laying out of the promenades on their ancient site. It is surmounted with a bronze bust of Guiollet, and an inscription recording the thanks of his fellow-citizens. Guiollet's grave is also on one of the Anlagen, the Obermainanlage, at the corner of the eastern wall of the Heilige-Geist Hospital, and the Rechneigraben Urbergang. It is beneath a group of shady trees, and is marked by a neat Gothic tombstone, whereon is the inscription:—"I. Guiollet, born 25th February, 1786, died 5th September, 1815." Somewhat further on near the Eschenheimer Thor or gate, is a bronze bust of the naturalist, J. C. Senckenberg. Here we must pause a moment to look at the picturesque old tower, one of the most perfect relics of the ancient fortifications.

The Eschenheim Tower is a quaint-looking structure, reminding one more of a wax-candle, with an extinguisher on it, than anything else one can imagine. It dates from the year 1346, or from that to 1350, and formed a part of the city walls built by the Emperor Ludwig, the Bavarian. Up aloft resides a Frankfort burgher,—a knight of St. Crispin, we believe, whose duty it is to strike the hours as they pass, and keep a good look-out for fires. In earlier times the watchman on the Eschenhim Tower had to report therefrom the coming of foes, or the more welcome approach of friendly merchants bent on doing business at the semi-annual fairs. But other times, other manners. The arts and accomplishments of peace and civilisation have even mounted so high: the cordwainer watchman has his piano aloft! The steep ascent to the summit is well worth climbing for the view it affords one of the city and the surrounding country. Legend has made a home in the old tower. The highest pinnacle is surmounted by a vane, in which nine round holes can be discerned, forming a figure of 9. The story goes that once upon a time, when the forest extended to the city gates, there was a notorious outlaw named Hans Winkelsee, who caused great trouble by reason of his misdeeds. Some say he shot the finest deer of the forest, others that he succeeded in stealing away the hearts of nine of the fairest daughters of the city. At any rate, a price was put upon his head, and when finally caught, he was incarcerated in the Eschenheim Tower, in a room immediately beneath the vane, there to await the carrying out of the capital sentence passed upon him. For nine days and nights, the period of his durance, he was prevented from getting a wink of sleep, because of the screeching of owls and the creaking and wheezing of the constantly-gyrating weathercock. On being led to execution, he begged of the city fathers one favour,—to be permitted to let fly nine bolts at the offending vane, and pierce it with a figure of 9, as a memento of his skill. Not only was the favour granted, but the bold bowman was promised his life and freedom if he succeeded in his self-imposed task. He sped nine shots, and the result was that wonderful vane. Says the old ballad:—

> "Talk not, ye proud old England, of your bold Robin Hood,
> For in these German lands of ours are bowmen stout and good;
> Boast not your sturdy hunters, rude Swissland and Tyrol,
> For on the Maine are archers who seldom miss the goal."

But the historian and the local chroniclers know nothing of Hans Winkelsee and his skill; and we are sorry to say we have only to do with a simple legend,—perhaps with mythology; for the number "9" plays therein an important *rôle*, as the reader can, if he likes, find out in Simrock. The existing vane, it should be said, is not the original one; it has been renewed on several occasions, the last time

being in 1874, after the tower had been struck by lightning.

Proceeding on our walk, we next come to the Friedberger Anlage. Here we find a monument to Baron von Bethmann, who succeeded, in 1813, in averting a descent upon the city for plunder, threatened by the First Napoleon. Next, just before reaching the Ariadneum, we come upon the Hessian Monument, erected in 1793, by Frederick William II. of Prussia, in honour of the Hessians who fell on the 2nd of December, 1792, in storming the city, then occupied by the French under General Custine. The monument consists of a heaped-up mass of rock, surmounted by a massive cannon-ball, and crowned with helmet, sword, battering-ram, and other warlike symbols. Close to the miniature lake, opposite the Bethmann Museum, known also as the Ariadneum, because of its containing the celebrated piece of sculpture representing Ariadne on the lioness, is also a bust of Bethmann (by Von der Launitz). On a slight eminence, above the water, is the Kursaal Milani, a pleasant *café*, where we may rest for a few minutes, and, the chief objects of interest before we reach the river again, having been passed, partake of refreshment, and where, on certain evenings during the week in summer, we may sit and enjoy the music of a first-rate band, while we drink in the scent-laden air, and refresh our eyes with the sight of the neatly-kept flower-beds and the pyramidal foliage of the trees.

Close to the promenade also are the Zoological Gardens, the Palm-gardens, &c., delightful places of resort. More interesting, however, is a spot to be found close by,—I refer to the churchyard of St. Peter's, where is the grave of Goethe's mother. The Church of St. Peter (on the Schaefergasse) possesses but little of interest to the stranger. Its graveyard, however, now transformed into a pleasant public garden,—another excellent example for the corporations of English towns,—contains some curious ancient gravestones, monuments, and sculptures. The tomb of the mother of Germany's greatest poet, however, is its chief attraction, and will not fail to be visited by all admirers of the bard. The "Frau Rath," as Frankforters delight to call her (born on the 17th of February, 1731), died on the 13th of September, 1808. Her grave is found to the right on entering the garden from the Schaefergasse. It is neatly surrounded with stones, and at the head is planted a weeping willow. Goethe's mother had a great influence on the intellectual development of her gifted son. The poet himself said of her:—

> "Von Mutter hab ich die Natur
> Und Lust zu fabuliren;
> Von Vater hab ich die Statur
> Und des Lebens ernster Füfren."

"From my mother I have inherited my nature and the love of the romantic; from my father my stature and the more earnest characteristics of my life." Goethe himself did not have the enjoyment of the beautiful promenades that later were created around the city of his birth. In his days the worthy citizens wandered out of the city gates, across the river, and to the shades of the forest beyond to find enjoyment and recreation. Even now the forest is the goal of thousands of persons every Sunday afternoon, though the modern institutions, the Zoological and the Palm Gardens, attract the more aristocratic crowds. But the Anlagen remain the most popular promenading ground for the citizens on Sundays, the wander-ground for the idler and the poet, and the playground for the nurses and children during the days of the week. The planners of English towns would do well to study the pleasant promenades and parks of Continental cities; they would find much to admire, and much worthy of adoption. They would learn how to make a provincial town a pleasant and attractive place, and to give the dwellers thereof beautiful parks and promenades that every one could enjoy, instead of, as is often the case, large parks at so great a distance that but few can enjoy them except on Sundays and holidays. In Frankfort, from the old ramparts have been created the charming promenades that we have attempted to describe as the Green Girdle of Health.

A Memorial Pulpit has been erected in the parish church of Slough, from the design of Mr. J. O. Scott, architect, and executed by Mr. Henry Terry, of the Lambeth-road. The materials are alabaster, rose antique, and Derbyshire red fossil marble columns, and marble mosaic. This church will be consecrated on Tuesday, the 24th instant, by the Bishop of Oxford.

AN IDLER IN PARIS AND ITS SHOW.

I FIND myself still loitering by Mr. Hans Makart's great work in the Austrian department, the "Entry of Charles V. into Antwerp." Of course this picture has been the subject of much discussion, many objecting to the preponderance of the light "amber" tint that pervades it; others, that notwithstanding the wonderful unity and clever grouping of the crowd, the faces do not seem to express either astonishment or curiosity; indeed, one critic thus expresses himself,—"This enormous canvas is rather a splendid operatic decoration than a picture." This I do not in the least agree with, and that its merit is acknowledged is proved by Mr. Hans Makart having been awarded the gold medal.

The other gentleman who shares this honour with Mr. Makart is Mr. Matejko (a Pole from Cracow, but long known and appreciated in France). He, also, exposes a very large and important picture, the "Union of Poland and Lithuania,"—the subject, the Diets of Poland, where the turbulent Palatines delighted to display their opulence and the splendour of their attire, gives great scope to the artist, as does his "Bénédiction d'une Cloche à Cracovie." The "Baptism of King Stephen of Hungary," by a Hungarian,—Gyulo Beneyur,—is also a very remarkable work. The gorgeous tone of the vestments, the expression of the prelate's face as he blesses the kneeling king, imbues the whole with life-like reality. Munkacsy, another Hungarian, has attracted considerable notice by his "Milton when Blind dictating 'Paradise Lost' to his Daughters." Milton is sitting in an arm-chair with his face towards us bent downwards, his three daughters are grouped round a table near him. One is writing, one spinning, and the other,—the prettiest one,—looking on and listening. Over the whole picture Munkacsy has thrown that grey yet warm, obscure yet lively, tone he seems to possess the secret of. The picture has been purchased for the Lennox Museum at New York. One corner of the saloon has a melancholy interest, for the young artist whose pictures occupy it is no more. One subject of which Mr. Cermack has given a touching representation is a wounded Montenegrin, whose comrades are bearing him back on a *brancard* of branches and leaves, and above him are placed those arms from which a Montenegrin is never separated. The other picture, "The Return Home," shows some unhappy Herzegovinians, who find on their return their houses in ruins and their fields devastated.

That which so singularly strikes one in the Austrian school of art is its grandeur; its Velasquez tone of colouring; its aiming after something higher than, perhaps, the artist is able to carry out, but who yet convinces you the aim *is* there, and carries you beyond the actual representation to the inspiration, and makes one think with Tennyson, slightly altered, "We need must love the highest when we *feel* it."

But in every department Austria has reason to be proud of her achievements: her glass, her jewelry, her bookbinding, which latter is a perfect marvel.

To the glass exhibit we naturally first direct our steps, and on every side see the loveliest tints, from palest pink to deepest rose, like the heart and leaf of that flower; deep royal purple blue, the turquoise, and the hue of the Neapolitan sky; green, from the dark shade of the forest-leaf to the pale tinge of the waters of the Nile; jewelled, enamelled, glittering goblets and vases, cup and beaker, glowing with the varying hues of the rainbow, or again with the changing light of the opal, greet the eye. The form and designs of their greatest works are *à la Renaissance*, and taken from models in the Gallery of Apollo at the Louvre and the Museum at Vienna, which possesses magnificent specimens of old work. The glass itself is very pure and clear, and the engraving on it is very fine.

But every style in its turn invites and claims attention, from "show" pieces, such as urns executed after designs by Professor H. Herdtle; some flattened amphoræ, after J. Salle, ornamented with handles in enamelled silver; the fine jug and goblet incrusted with precious stones, having at the base beautiful little silver figures emblematical of the rivers Wien and Danube, and presented by Mr. Lobmeyer (whose entire exhibit is very perfect) to the Hôtel de Ville of Vienna, down to the huge Scandinavian-looking drinking-horn that only some mighty Viking of old could have drained to the dregs.

We pass on to look at the porcelain, which is not only very beautiful, both in form and colouring, but also very reasonable.

Fischer & Mieg have a very interesting exhibit: their establishment is, in some measure, I believe, a sort of Austrian "Sèvres," and 1,200 workmen are constantly employed there. The Austrian jewelry is very cheap, and Messrs. Markowitch are especially to be commended.

The bookbinding is very remarkable. The leather-work, the incrustations of enamel, the silver-work, mixed with it, make them things of sufficient beauty and value to be handed down as heirlooms in a family. As workers in iron the Austrians also excel. In plying, bending, chiselling, rounding it, in making it take every conceivable form, they are not to be surpassed. I heard the other day, though I know not how true it be, that they have discovered some means of working the slag or refuse iron into a fibre softer and more flexible than silk, and that it may be woven into dress material. However, as I have not seen any specimen of the kind, I will not vouch for the truth of the statement. The furniture, the rich brocaded silks, the stamped velvets, the hand-made lace sent from the mountains of Bohemia, a magnificently chiselled silver coffer belonging to the Emperor, the endless pretty little "nothings" peculiar to Vienna,—each in turn claims attention; and then we pass on to the extraordinary exhibit Mr. Louis A. Goldschmidt offers us of opals from the mines of Lubnik and Eperies, near Kaschan, in Hungary. Hungary is, I believe, the only country in Europe where opal-mines exist, or, at all events, it is the principal spot (with Australia) in the world where the finest ones are found. Here we have before us pieces of the rock with the opals still embedded in them, and which look, ere they are cut and polished, like bits of *blanc-mange*. Then a new idea has been inaugurated, the opal and rock are cut and partly combined together, and the metallic colours of the rock give a singular appearance to the jewel. There is also a rare specimen of a black opal,—one nearly green,—one nearly red, and one immense stone, supposed to be the largest one known, which is uncut, though polished, and is valued at 8,000*l*.

To end a pleasant day we wander away to the French exhibition of rare books and manuscripts, which was first pressed upon my notice by reading one of the very delightful articles of an American gentleman, who writes under the *nom de plume* of "Broadbrim," and who is as well known and esteemed in the circles of New York and Paris for his genial social qualities as for his keen intellect. I cannot do better than quote his own words:—"Close to the main hall on the north-west end of the Exhibition building, and immediately adjoining the British department, is a rare exhibition of statuary by the modern artists of France, but it is not of this that I now propose to speak, but of a little exhibit in a room on the left of rare and exceptional merit. Thousands daily pass it by; no statues mounted on pedestals attract them, no splendid pictures challenge their admiration. There is nothing here but a few books, manuscripts, and medals. Only this and nothing more. Yet in these low and unpretending cases are priceless treasures richer than Pluto's mine, not treasures of silver and gold, not jewels, not costly array, but rare books and curious old manuscripts, whose histories go back into the very twilight of time. The mere pleasure-seeker and sight-seer had better pass on his way, for this exhibition has no attraction for him; but it is sacred as Mecca to the scholar and man of letters. This is the exhibit of the French Bibliothèque, and of manuscripts—some of them so old that we have no authentic history of the people by whom they were originally written. They are Egyptian, Assyrian, Greek, Persian, Arabic, and Hebrew. Before me is a contract for a piece of land, written 500 years before the birth of Christ, every character as bright and clear as if cut by an engraver's tool. The cases are full of rare reprints of works—choice specimens of that art which has made immortal the names of Guttenberg and Faust. Right royally here an ancient Theban bears testimony to the virtues of his departed wife, and yet, when this hoary manuscript was indited, Queen Esther was pleading for the life of her people before the great King Ahasuerus. Hear the dead man speak after a lapse of more than thirty centuries, and listen to the testimony with which he has embalmed in immortality the gentle memory of this fair Theban wife. "She was comely to look upon," says the chronicler, "and of temper, so sweet and placid that in all her life I never saw it

ruffled. She was kind and charitable and loving, and of life so pure and holy that the breath of suspicion or scandal never assailed her." Three thousand years have passed since this grand testimony of virtue and love was written. The race to which she belonged has been annihilated and blotted out. The sands of the desert roll like an angry sea over the proudest of its imperial cities. Yet surviving the history of its magnates and kings is this shining tablet to the virtues of a Theban wife, whose holy life is thus immortalised, but whose name is unfortunately lost to posterity for ever. Near by is a will written about the time that Hiram was preparing the stones which were used in the Temple of Solomon. The characters are Greek, and the oldest known to literature. It was made in the island of Cyprus, before Homer had written the "Iliad," and whilst philosophy was yet a stranger to the sacred groves of the Academy. Not only houses and lands fell to the lot of the dainty Cypriot dame, but stores of jewels and gold that might have furnished the outfit for "the Queen of Sheba."

Here, also, in a brief space, France has enshrined her immortal dead, and here she has preserved in gold and silver and bronze the heads of those who, through all past time, have built up her greatness and her glory. The memory of her emperors and her kings receives no more gracious tribute than that accorded to her philosophers and scholars, and the men whose humanity and self-sacrifice have earned an enduring immortality. Ludovicus Magnus is near to the gentle Melancthon, and the little Corsican captain, who rose to imperial power and died at last a captive and in exile, lies quietly beside Pascal, from whose bed of agony came forth the noblest and sublimest philosophy of France.

The horse-show, which has been held on the Esplanade des Invalides, has just come to an end. About 1,000 horses,—belonging to France, England, Russia, Belgium, Holland, Hungary, Italy, and Denmark,—were there congregated. The costumes of the various men who take care of them rendered the exhibition rather picturesque. The Hungarians have a sort of brown vest with white tunic; the Bretons, round jackets; the French, a kind of semi-military uniform; the Russian moujiks, red and black, with peacock's feathers in their caps. One of the most beautiful horses there was a Russian horse called Drouze, black as jet, graceful as an Arab, and gentle as a child. He has been all through the last Russo-Turko campaign, and bore his imperial master, Duke Nicholas, safely across the Balkans.

A very pretty sight was a Russian drosky, with blue and silver harness, and three "dappled greys" to conduct it.

The postponement of the distribution of the prizes has been a cause of great annoyance to many here, and poor M. Krantz has not had the most enviable life lately. But I must say, I think the date he has chosen a wise and rational one, however little my opinion may be in unison with that of the majority.

FROM LIVERPOOL.

THE annual picture exhibition at Liverpool, opened the other day in the Walker Art Gallery, may probably be safely characterised as the best "annual" exhibition of the kind that has been held in any provincial town. A good many of the most striking works from both the Academy and Grosvenor Gallery exhibitions of this year have found their way there, including Leighton's "Winding the Skein," Tadema's "Sculptor's Model," Watts's "Death and Time," Burne Jones's "Laus Veneris," &c.; but in addition to these and other centres of interest, there is also a very high average of merit and interest in the collection generally, and a remarkable scarcity of bad pictures. This is the more gratifying, as some of the previous exhibitions since the revival of the annual exhibition were so exceedingly mediocre, and the taste and judgment displayed in the choice of pictures purchased for the town so more than doubtful, as to give rather poor promise for the future of Liverpool in these matters. But this year's exhibition is a great step in advance, and we may confidently hope that this great commercial centre will now hold its own as an artistic centre also in the provinces. It would be a good step, however, to begin by getting rid (if possible) of three-fourths of the pictures which in previous years have been purchased or presented as contributions to the formation of a permanent gallery of art in the town, and which in regard to such an object are of no value whatever, and in one or two instances show an absurd want of knowledge on the part of whoever has been responsible for their acquisition. The ventilation of the galleries should be ameliorated as soon as possible; they have unfortunately other defects which it is too late to mend, but this particular ill may be modified. It appears, by the way, that Mr. Tadema has given dire offence to the moralities of some of the natives of Liverpool by his picture before mentioned, and quite a storm in a saucer was raised over it by moral and indignant correspondents in the local journals. It is a pity that people who do not understand what pictures are made for should be allowed to go into exhibitions. Could not a test examination be established in a few brief and pointed questions, the satisfactory reply to which should be the condition of entrance?

The group of buildings now formed by the Brown Museum, the Picton Reading-room, and the Walker Art Gallery (all, it may be observed, named after munificent townsmen of Liverpool) is an unusual one to come upon, and only wants a little of being a very effective combination. The good effect which it has partly arises from the combination of a formal style with an informality of grouping; the Library and the Art Gallery standing at an angle to one another, and connected by the circular Reading-room. The latter, with its colonnade of the Corinthian order, has a very elegant appearance; it is, however, a pity that the roof is so low as not to show as part of the design, and the building has the appearance of wanting a finish to it. The other two buildings are somewhat commonplace in detail, but still the whole has a stately effect, especially now that the masonry is still fresh and new. The Art Gallery has its statuary decoration also, which has been before mentioned in our columns; but the great building opposite still remains undecorated with the sculpture which Elmes designed to be its crowning beauty. We have often called attention to this, and we fear it is likely that we shall often have to do so again. It is surprising that a town which seems so desirous to take rank as an artistic place should thus persistently neglect the completion of its greatest building.

Opposite to St. George's Hall the addition to the London and North-Western Company's Railway Station is slowly progressing. The addition consists in nothing less than doubling the size of the station by the erection of a second span of iron roof alongside of the existing one, the present roof of which replaced, not so many years since, a previous one of smaller span, but which was considered in its day one of the best efforts of modern engineering in this class of structure. To facilitate egress from the enlarged station, a great part of the tunnel leading out of it has been enlarged, or rather turned from a tunnel into a cutting. At present the majority of the roof principals of the new half of the new station are up. How the front is to be finished there is as yet no indication: it can hardly be by another hotel, considering the great size of that which forms the front to the existing station. While on railway matters, we may mention that the new station at Birkenhead is now open, which brings the train service from Chester and other parts of the country directly to the gates of the principal river ferry. The new station has a double span iron roof of simple construction, and very light; there has been some attempt at architectural treatment of the substructure in a semi-Gothic taste, not altogether unsuccessfully, though more might have been made of it with the same materials. The defect of the station is that the covered portion is not long enough to take any but a rather short train fully under cover; a great deficiency in a new station. It is, however, a great and much-needed improvement on the dingy and confined establishment which has long served Birkenhead for a railway station.

There is a continued progress in Liverpool street architecture. A new Stock Exchange and Corn Exchange are both in course of erection; in the latter, which is still in an early stage, Mr. Hornblower's patent fireproof construction, which has been a good deal spoken of in connexion with this class of construction, is employed. The Stock Exchange building, near the Exchange, is in an advanced stage, and, in fact, nearly complete, externally. Its connexion with the adjacent buildings affords rather a ludicrous instance of the effect which considerations of property interest sometimes exercise upon architectural appearance. The site is close to the corner of Dale-street and Exchange-street, and the promoters of the building wished naturally to make an angle building of it, and give it two fronts, but on the Exchange-street side there intervened a very narrow slice of old building consisting of small shops only a few feet deep from the frontage: the holders of which property, supposing it a *sine quâ non* for the Stock Exchange building, were so exorbitant in their demands that it was ultimately determined to dispense with the frontage, and the new building was carried up in the rear of the shops, rising considerably above them; and it now presents the absurd spectacle of a large block of new work with an exceedingly thin slice of dingy brick building clinging to its side. In regard to architectural improvement, the result is very unfortunate, and it is a pity that powers were not obtained to compel the sale of the old property on the ground of public interest in the improvement of the town, as the whole of Exchange-street has been rebuilt in recent times except this portion, and it must be exceedingly difficult for any one to know what to make of it now. This is one of the cases in which a little despotism would be of advantage to architecture, as it often has been before.

THE CITY TEMPLE, HOLBORN VIADUCT.

THE City Temple, which has been closed since the last Sunday in July, in order that the decorative details originally proposed by the architects of the building, Messrs. Lockwood & Mawson, might be completed, will be opened again on the 29th of September. The associations of this edifice are closely connected with the growth of Nonconformity in London. If we say it is the meeting-place of the oldest Congregational Church in London, it may perhaps surprise some persons, but it is consonant with fact. The congregation which owns this edifice was first founded in the year 1642, by Dr. Thomas Goodwin, as the tablet erected in the principal vestibule, by Mr. Physick, of Marylebone, shows. The inscription says:—

"The Church first met in Anchor Lane, Thames Street;
Thence removed in 1672, to Paved Alley, Lime Street;
Thence in 1755, to Miles Lane;
Thence in 1766, to Camomile Street;
from
thence in 1819, under the ministry of the
REV. JOHN CLAYTON,
to the Poultry, Cheapside;
And thence in 1873, under the ministry of
JOSEPH PARKER, D.D.,
to the south-western end of Holborn Viaduct."

The congregation assembled in Anchor-lane had been gathered by the celebrated Dr. Thomas Goodwin, soon after his return from Holland, at the beginning of the Long Parliament, in 1640. It next worshipped at a meeting-house in Paved-alley, Lime-street, erected about the time of King Charles's Indulgence, in 1672. The Church in Lime-street continued to flourish under Dr. Thomas Goodwin, Dr. Thomas Harrison, Thomas Mallery, John Collins, Francis Howel, John King, Nathaniel Mather, Robert Trail, and a succession of valuable ministers, till Christmas, 1755, when the congregation had to quit, as the East India Company purchased the site. Mr. Richardson, the pastor from 1736, then resigned; the church and congregation divided. One part went to Artillery-street, where Mr. Richardson resumed the pastoral office. That which was considered the largest branch removed to Miles-lane, where they worshipped on Sunday morning in the meeting-house of Mr. Jollie's congregation. The church books were retained by this branch of the division, and are now in the possession of the City Temple. The congregation next erected a new meeting-house in Camomile-street, opened in 1766,—"a good brick building of moderate size, with three galleries." During Mr. Clayton's ministry (1805-1847), the church rapidly increased, and in 1819 the Poultry Chapel was erected. Mr. Clayton was succeeded by Mr. Bergne, who resigned in 1853 to accept the post of Secretary to the British and Foreign Bible Society, which position he still holds. The latter's successor, the late Rev. Dr. James Spence, commenced his ministry at the Poultry Chapel in June, 1854, and resigned in 1866, when he went to the Old Gravel Pits Church, Hackney. Then followed a vacancy of three years.

We come now to deal with the immediate past and the present time. After negotiations extending over three years, they were at last brought to a successful issue by Dr. Parker

accepting the pastorate in September, 1869, upon the distinct understanding that the church should "embrace the earliest appropriate opportunity to sell the property [the Poultry Chapel], and erect a noble structure on the best available site that could be obtained." Dr. Parker preached his first sermon in the Poultry Chapel on September 19th, 1869. The consent of the Charity Commissioners having been obtained, the property was sold by public auction on May 21st, 1872, realising the magnificent sum of 50,200*l.*, the London Joint-Stock Bank being the purchasers. That company immediately utilised the building by converting what was once a church into a bank, leaving all the exterior walls in their entirety, but fitting up a gallery and all accessories required in a banking establishment.

The Charity Commissioners, before consenting to the sale, insisted upon another site being secured, and provision made for conducting the services in the interim in a suitable place. Turned out of the Poultry Chapel, the congregation found temporary accommodation for morning service in the great hall of Cannon-street Hotel, and at Exeter Hall for the evening. The congregation had been successful in securing the convenient and central site the City Temple occupies, from the City Corporation, for a sum of 25,000*l.* The preliminary arrangements being quickly completed, the foundation-stone was laid by the late Dr. Thomas Binney at the base of the tower, on May 19th, 1873. Twelve months after, on May 19th, 1874, the church was opened for public worship.

The City Temple is situated on the south side of Holborn Viaduct, and immediately to the east of St. Andrew's, Holborn. The foundations are 30 ft. below the level of the Viaduct. The edifice consists of two stories, the lower being of the Roman Doric, and the upper of the Corinthian order. It bears favourable comparison with the rest of the buildings in its vicinity. The centre of the principal front is formed by a recessed portico, and at the north-west angle there rises a square tower, surmounted by a belfry, and capped by a dome, the elevation of which is 125 ft. from the Viaduct. On the ground-floor are five doors, which give access to a vestibule, from which, on each side, a staircase leads to the gallery. The breadth of the building is 78 ft.; height, 50 ft.; length, 147 ft. The whole area of the building, with the exception of the staircases in the four angles,—a space 120 ft. in length, and 63 ft. in width,—is utilised for seats, and provides, with the galleries running round three sides of the great hall, sitting accommodation for 2,500 persons. There being eleven windows on each side, and five over the front doors, there is no want of light and ventilation. The basement contains a schoolroom, 64 ft. by 57 ft., and 18 ft. in height; also a ladies' committee room, 41 ft. by 25 ft.

The circular stained-glass window of the south wall was presented to the Temple by Dr. Nathaniel Rogers, of Exeter, and has been put in since the opening of the building. The sixteen memorial windows of the clearstory, erected at the expense of some private friends of Dr. Parker's, were unveiled on March 11, 1877. The windows are semicircular in form, and at considerable height from the floor. Eight are entirely decorative in design; the other eight contain winged seated figures representing the virtues: Patience (dedicated to the memory of Richard Baxter); Charity (dedicated to John Bunyan); Truth (to George Whitefield); Chastity (to Anne Askew); Wisdom (to John Howe); Hope (to Charles Wesley); Faith (to John Wesley); and Temperance (dedicated to Oliver Cromwell); Charity, Truth, Hope, and Faith being female figures. The building being of a quasi-classic type, it was necessary to make the figures approach the same style, and so to depart from the description of glass usually used for non-secular purposes. All the glass is pot-metal, without any enamel. The cartoons were drawn by Mr. Walter Hensman, and the glass was executed by Messrs. W. Phillips & Son.

To mark its interest in the movement, the Corporation of the City, by a vote in the Court of Common Council of fifty-six to thirty-two, presented to the Temple a pulpit of inlaid marble, at a cost of 300 guineas.

The organ, placed in a recess behind the pulpit, and pronounced by a competent authority to be "as beautifully voiced and evenly balanced as any in the City churches," was ilt by Messrs. Forster & Andrews, of Hull, and was opened on May 1, 1876. The case has circular towers, and is carried out in pitch-pine. The front pipes are decorated. The whole of the bellows, feeders, and hydraulic engines are placed in the basement of the building, from which the wind is conveyed, through metal tubes, upwards of 50 ft., to the organ. There is pneumatic movement to the great manuals and all couplers in connexion therewith.

The entire cost of this building was 56,537*l.*, exclusive of the organ, pulpit, and memorial windows; which sum includes 25,000*l.* for the land, 26,444*l.* for the contract with Messrs. George Myers & Sons, the commission for the architects, and 1,500*l.* for one and a half year's ground-rent to the City during the erection of the building. Towards this sum, the committee had in hand 50,850*l.*, which was derived from the sale of the Poultry Chapel, leaving a deficiency of nearly 6,000*l.*, which has since been covered by subscriptions.

This year has been chosen for completing the building in order to pay a mark of respect to Dr. Parker, who on the 8th of November will complete his twenty-fifth year as a Congregational minister—in Banbury, Manchester, and London. The architectural reason for delaying the completion until now is that it was desirable to allow a building of such magnitude time to settle and to perfectly dry before putting the finishing touch to its internal decoration. The funds required for the purpose, about 3,000*l.*, will be collected by spontaneous contribution.

The works on the point of completion, the contractors being Messrs. W. Phillips & Son, include the construction of a gallery around most of the area of the large school-room; erecting and furnishing private rooms for the use of the pastor in conferences, &c.; the introduction of a heating apparatus for the warming of the corridors, vestibules, and staircases; also improvement of the ventilation generally; finally, the cleansing, painting, and decorating of the entire building, internally and externally, which is now nearly completed.

ANOTHER ROUND OF VISITS.

THE SOCIETY OF ENGINEERS AT CROYDON.

ON Wednesday in last week the members of the Society of Engineers, to the number of about thirty, visited Croydon, and there spent a most agreeable and instructive day. Arriving at East Croydon Station shortly before half-past ten o'clock, the visitors at once proceeded to the extensive and widely-known steam clock-factory and bell-foundry of Messrs. Gillett & Bland, situate in White Horse-road. Here they were courteously received by the principals, and conducted through the various departments of the establishment, which, as was remarked by one of the visitors, is probably unique of its kind, seeing that every branch of work required in the manufacture of clocks and bells of all kinds is executed on the premises. Raw material, in the shape of iron, brass, copper, and timber of all kinds, may be said to go in at one door of the establishment, only to come out in the shape of clocks or bells at another. It is from the fact that the works are thus self-contained that a visit to them is so exceptionally interesting and instructive. Proceeding first to the foundry, the visitors witnessed the casting of a couple of bells, one of which, a tenor, weighing 10 cwt., is to be hung at St. Luke's Church, Maidenhead. Among many other bells awaiting tuning, prior to being despatched to their respective destinations, the visitors saw one weighing 8 cwt. (the tenor of a peal of eight), which has been cast for Sir Henry Peek's new mansion at Rousdon, Devon, and smaller ones for Totnes and Wincanton town-halls, Alnmouth, Rossie Priory, and Maidstone (St. Philip's) Churches, and Bristol Grammar School, Aldershott Hospital, &c. Of the numerous large clocks which the visitors saw, the "movement" of that for the new town-hall at Manchester (the other parts of the clock being already fixed) attracted an amount of attention proportionate to its size and importance. This clock will strike the hours on a bell 7 tons in weight, in the key of G, and will chime the quarters on ten bells. It will have four illuminated dials, 16 ft. in diameter. The main frame is on the horizontal plan, of solid cast iron, 12 ft. long, 4 ft. 6 in. wide, and 4 ft. 2 in. high, and weighs 1¼ ton. All the wheels are of gun metal, turned, cut, and polished. The main wheels of the striking and quarters are 2 ft. 6 in. diameter, and the main wheel of the going part 2 ft. in diameter, all the rest of the wheels being in due proportion. The bosses in which the pivots run are also of gun metal, screwed into the frames. There are engraved and silvered dials on the clock, showing hours, minutes, and seconds, for the purpose of regulating the outer hand and for taking observations. The pendulum is a compensated one, made of zinc and iron tubes to beat two seconds of time, with a cast-iron cylindrical bob of about 6 cwt., which is to be suspended from a cast-iron bracket fixed on a stone corbel built into the wall. The barrels are made of cast-iron, turned and grooved. From them will be suspended by patent steel lines, the weights, weighing over 2½ tons, which will drive the clock. The striking cams and levers are all hard steel-faced. The escapement, which is a very ingenious piece of mechanism, is the "double three-legged gravity," which is stated to be infinitely superior to all other kinds for perfect timekeeping. There is an automatic gas apparatus fitted to the clock for turning the gas up and down, and so contrived as to suit all seasons of the year, providing for long and short days, similar to a perpetual calendar, so that no attendance whatever will be required to turn the gas on and off. Messrs. Gillett & Bland were the inventors of this apparatus, which they first applied to the Bradford Town-hall clock. The chime part of the clock is constructed on a new principle, so that the changes for the quarters can be altered at any time. The carillon machine, now being fixed, will play thirty-one tunes on twenty-one bells, whose aggregate weight will be about 32 tons. This carillon will be the largest in this country, and will play fresh tunes for every day in the month at intervals of every three hours, day and night. As the bells will have a range of twenty-one notes, extending from G on the lowest line in the bass clef to F sharp on the lowest space in the treble clef, and will admit of tunes being played in five different keys,—C, G, D, A, and E,—a greater variety of melodies may be played than on any other bells in this country. It is unnecessary to dwell on Messrs. Gillett & Bland's achievements in this particular branch of campanology, for it is one which, by common consent, they have made their own. The many improvements which they have introduced into bell-chiming machinery are all advances towards simplicity and directness of action, and they may be said to have attained the *acme* of perfection, both in regard to regularity of performance and ease in working. To attempt even a partial enumeration of the important works the firm has carried out at churches, mansions, and public buildings throughout the length and breadth of the land, as well as in foreign countries and in our colonies, would occupy more space than we have available; but we may note as among the most important and interesting of these, the clock, chimes, and carillons for Sligo Cathedral and Christ Church Cathedral, Dublin, and the carillons for Worcester Cathedral. The latter play twenty-eight tunes. We may say, in this connexion, that in the *Builder* for March 21st, 1874, we gave a view and plan of the bells and bell-chamber, together with a view of the carillon machine, at Worcester. To conclude our remarks on this busy factory, we have only to add that a visit thereto is pregnant with instruction to all who have eyes to see. Ingenious, yet simple, contrivances of all kinds abound for making, with marvellous speed, though with mathematical exactitude, the various component parts of a clock. At one bench, for instance, we noticed a wonderful little machine for cutting toothed wheels, the cutter revolving something like 20,000 times a minute. Incidentally, the visitors saw several of the "tell-tale" clocks which the firm makes for her Majesty's Post-Office. In these clocks, the dial projects slightly forward from what would be, in ordinary timepieces, the dial-surface. This projecting dial revolves as the hours advance, and its periphery is furnished with a number of projecting pins, so placed that one of them shall be, every quarter of an hour, exactly under a stud or depressor which has to be pulled down from the exterior of the clock-case by the watchman in charge. Should he be away from his post, or asleep when he ought to be on the *qui-vive*, one of these clocks will unerringly tell the tale of his remissness. Before leaving the premises, the visitors, through Mr. Bernays, the vice-president of the Society, thanked Messrs. Gillett & Bland for the privilege of visiting the factory.

Proceeding next to the Croydon Waterworks, in Surrey-street, under the guidance of Mr. Baldwin Latham, the visitors were received by Mr. Corrie, the chairman of the Water Committee, and by Dr. Strong, a member of the Local Board of Health. Mr. Latham first of all explained some simple contrivances devised by him for registering the water-level in the wells from day to day, the registration being effected by means of pencil marks on scaled diagram paper. By similar means Mr. Latham registers the varying levels of the subsoil water, and a comparison of the diagrams thus obtained for several years past affords an instructive commentary on the connexion subsisting between the level of the subsoil water and fever epidemics. Two Cornish pumping-engines are located in a building of some architectural pretensions, in the Gothic style, erected from the designs of Mr. Baldwin Latham some ten or twelve years ago. These engines are now, however, partially disused, the bulk of the water (2,800,000 gallons a day) being now derived from a large new well which has been sunk adjoining the main building. This well is pumped by one of Davey's compound differential pumping-engines, which is housed in a wing or annexe to the main building, erected from the plans of Mr. Walker, the present engineer to the Local Board of Health. This new engine was fully described by Mr. Davey, its inventor (Hathorn, Davey, & Co., Leeds). The following details may be interesting. The engine has a high-pressure cylinder, 30 in. diameter, and low-pressure cylinder, 60 in. diameter; the length of stroke is 7 ft., and it makes ten strokes per minute. The diameter of the barrel pump is 26 in.; diameter of plunger, 17 in.; height of lift, 200 ft.; number of gallons raised per minute, 2,500; boiler pressure, 50 lb. per square inch. The surface condenser has 452 horizontal tubes, each 7 ft. long and ⅝ in. diameter; the tubes have a superficies of 640 ft. The engine is connected to a double-acting pump (placed vertically in the well) by means of a wrought-iron quadrant, and lifts water through the mains at a speed of 230 ft. per minute. The peculiar characteristics of the engine consist in the differential valve gear, and in the quality the engine possesses of realising a high degree of expansion, with a moderate piston-speed, with little dead weight to put in motion, and small variation of strain on the engine and attachments. It, together with the other portions of the waterworks, as well as the method of dealing with the sewage, should be seen by engineers and others interested. There is every facility for seeing all that is to be seen, the Croydon Local Board and its officers making it a great merit not to hide their lights beneath bushel measures. While chronicling the visit to the waterworks, we may notice that Mr. Baldwin Latham stated that there is a great flaw or fissure in the chalk beneath Croydon, and hence the copiousness of the water supply. He expressed the opinion, however, that it was a great mistake to have enlarged the water supply on the present site of the works in Surrey-street. He had to some extent been a "thorn in the flesh" of the Local Board by his opposition to the extension, and he hoped that, before very long, the Local Board would see the importance of removing the new pumping-engine further afield, so as to improve the supply.

Mr. Latham, having handsomely entertained the visitors at luncheon at the Greyhound Hotel, made a few remarks in responding to the toast drunk in his honour. In reference to the Beddington Sewage Farm, he observed that it was an indisputable success, both from an agricultural and from an economical point of view. The Croydon Local Board of Health came into existence nearly thirty years ago (in 1849), and they had been the pioneers in much good work that had been done in sanitary matters. It was now eighteen years ago since the Board adopted irrigation as the mode of dealing with their sewage, and during the whole of the period that had since elapsed the town had been free from actions and lawsuits, whereas previously the Board was beset and bewildered by innumerable lawsuits and injunctions, restraining it from turning the sewage into the River Wandle. By means of passing the sewage over the land at Beddington, the effluent was rendered quite inoffensive before it went into the river. Not even the most fastidious and captious critics had been able to show that the farm was a nuisance in any way. There was no miasma, and it was impossible that the water-supply could be in any way affected, as the level of the highest land on the farm was absolutely lower than the lowest water in the wells at Croydon. The farm having been so successful, and a model for imitation in other districts, it was only right to say that it was laid out by Mr. Fenton, formerly surveyor to the Board, acting on a suggestion contained in a report on the subject by Mr. Cox and Professor Donaldson.

The visitors then proceeded to Brimstone Barn, where they saw two of Mr. Latham's rotary sewage-extractors at work. The solid matters obtained from the sewage are mixed with road-scrapings, and sold to the farmers for manure.

After a long and bracing walk over the fields, the visitors found themselves on the farm, where they were received by Mr. Parrett, the manager. The farm is cultivated alternately with rye-grass, mangold wurtzel, &c., and has a gentle fall towards the River Wandle, so that the ground is admirably suited for the purpose to which it is now so successfully devoted. The visitors having noticed the state of the sewage as it flows on to the farm, had the opportunity (after a good deal more pedestrianism over rather rough ground) of seeing its condition as it flowed off after once passing over the land: its appearance was certainly very limpid, but before it was allowed to pass into the Wandle it was again run over the land, the resultant effluent being, to the eye at least, all that could be wished for. The "carriers" are simply channels or miniature canals made in the ground, and those not in use were innocent of sedimentary matter to an extent which testified to the efficiency with which the extractors at Brimstone Barn do their work. Neither was there any offensive smell pervading the farm, notwithstanding that the day was warm.

Altogether the visitors had a most pleasant and instructive outing.

THE PALACE HOTEL, SAN FRANCISCO.

THE Palace Hotel occupies the entire block upon the south-west corner of New Montgomery-street and Market-street, rearing its huge fronts 120 ft., extending 275 ft. westerly up Market-street and Jessie-street, and stretching its vast flanks 350 ft. southerly along New Montgomery-street and Annie-street. This architectural monster lifts its colossal bulk above the business and social centres of the city. Lines of horse-cars connecting directly with all principal streets, business centres, leading places of amusement or resort, and all notable localities, constantly traversing the vast city even to its remotest suburbs, run directly by or within a minute's walk. At the neighbouring foot of the city's grand Central Avenue, which passes directly under its northern front, are the stations and docks of the Great Overland Railway Terminus, with the piers and slips in every habitual or pleasurable direction. A few blocks south lie the immense docks and basins of the P.M.S.S. Co., with their grand fleet of trans-Pacific mail steamships, for the Sandwich Islands, China, Japan, Australia, India, and the nations of the Orient; 96,256 square feet, or nearly 2¼ acres underlie the stupendous structure itself, while the sub-side walk extensions increase the basement area to upwards of 3 acres.

Its general form is an immense triplicate hollow quadrangle, including one grand central glass-roofed garden-court, flanked by a lesser and parallel court on either side. Seven lofty stories surmount the lofty basement, and through a considerable portion it has eight. The lower story has a height of over 27 ft.; the uppermost, 16 ft. The deep foundation-wall is 12 ft. thick. Stone, iron, brick, and marble are the chief materials. Of bricks alone, its construction consumed 31,000,000. All the outer and inner partition-walls, from base to top, are of solid stone and brick, built around, within, and upon a huge skeleton of broad wrought-iron bands, thickly bolted together, and of such immense size as to have required 3,000 tons of iron for this purpose alone. Thus the building is really duplex,—a huge self-supporting frame of iron, of enormous strength, within massive walls of firm-set brick and solid stone. The outer and visible walls are proof against fire; the inner and invisible frame secures against earthquakes. The supporting columns, within and without, are iron; the cornice, of iron and zinc.

Four artesian wells, having a tested capacity of 28,000 gallons an hour, supply the great roof-tanks, holding 130,000 gallons. Three large steam fire-pumps force water through forty-five 4-in. wrought-iron upright fire-mains, reaching above the roof, and distribute it through 327 2½-in. hose-bibs and 15,000 ft. of five-ply carbolised fire-hose, thus doubly and trebly commanding every inch of the structure, from roof to basement, within and without.

Five patent safety-catch hydraulic elevators, running noiselessly within fire-brick walls, ascend even to the roof promenades. Electric fire-alarms, self-acting, are arranged instantly to report at the office the exact locality of the fire, or even of extraordinary heat in any parlour, bedroom, closet, hall, passage, stairway, or store-room. Special hotel watchmen regularly patrol all parts of the building every thirty minutes day and night. A self-acting and self-registering tell-tale indicator instantly reports at the office any neglect or omission of their duty. Besides all these precautions, a fireproof iron staircase, inclosed in solid brick and stone, and opening through iron doors, upon every floor, ascends from basement to roof. Every floor has its exclusive annunciator, and its own tubular conductor, carrying all letters for the post-office directly to the main letter-box in the general office. A pneumatic despatch-tube instantaneously conveys letters, messages, or parcels to or from any point on the different floors. Two thousand and forty-two ventilating tubes open outwards upon the roof, including every room, bath-room, and closet, and so insure constant purity and thorough sweetness of air in every part.

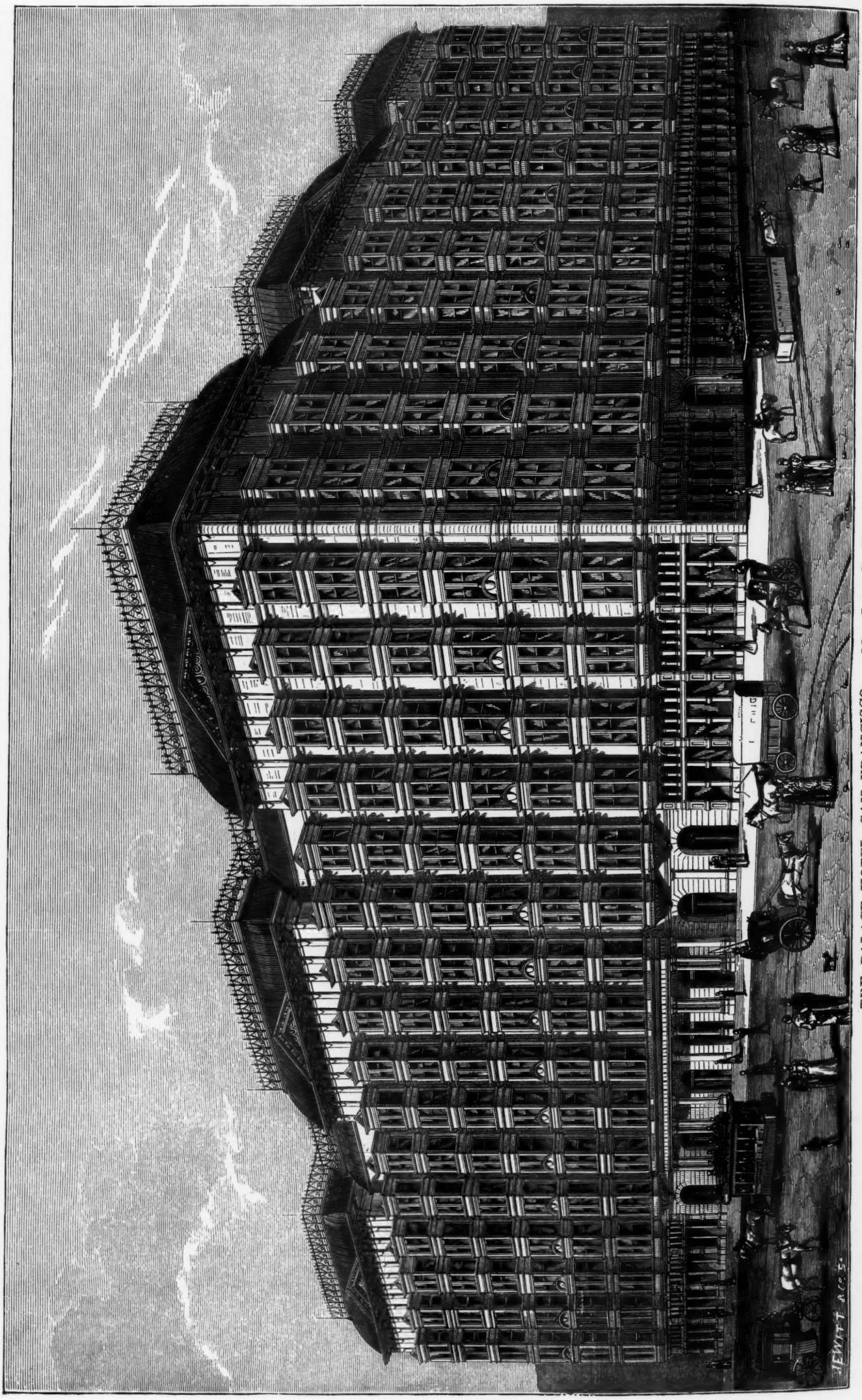
The grand central court, 144 ft. by 84 ft., has a carriage and promenade entrance through the east front on New Montgomery-street of 44 ft. width, expanding into a circular driveway 52 ft. in diameter, surrounded by a tropical garden of rare exotics, with statuary and artistic fountains. Within this court, opposite the main entrance, is the music pavilion, in which the instrumental band, exclusively attached to the palace, render choice selections.

Off the central court open the main entrance to the hotel office, 65 ft. by 55 ft.; entrances to the breakfast-room, 110 ft. by 55 ft.; the grand dining-room, 150 ft. by 55 ft.; the music and ball room, 65 ft. by 55 ft.; the ladies' lower parlour, 40 ft. by 40 ft.; reading-room, same size; billiard-rooms, 65 ft. by 40 ft.; barber's shop and bath-rooms, 40 ft. by 40 ft.; committee and other compartments for convenience of patrons. On the second floor are dining-rooms and ladies' drawing-room. The total number of rooms exclusively for guests above the garden floor is 755,—most of them are 20 ft. square, none less than 16 ft. by 16 ft.,—they are beautifully furnished. The carpets are designed exclusively for this hotel; the furniture has been made in San Francisco of the native woods, at a cost of over half a million dollars. All the rooms have approaches from the arcades surrounding the inner courts.

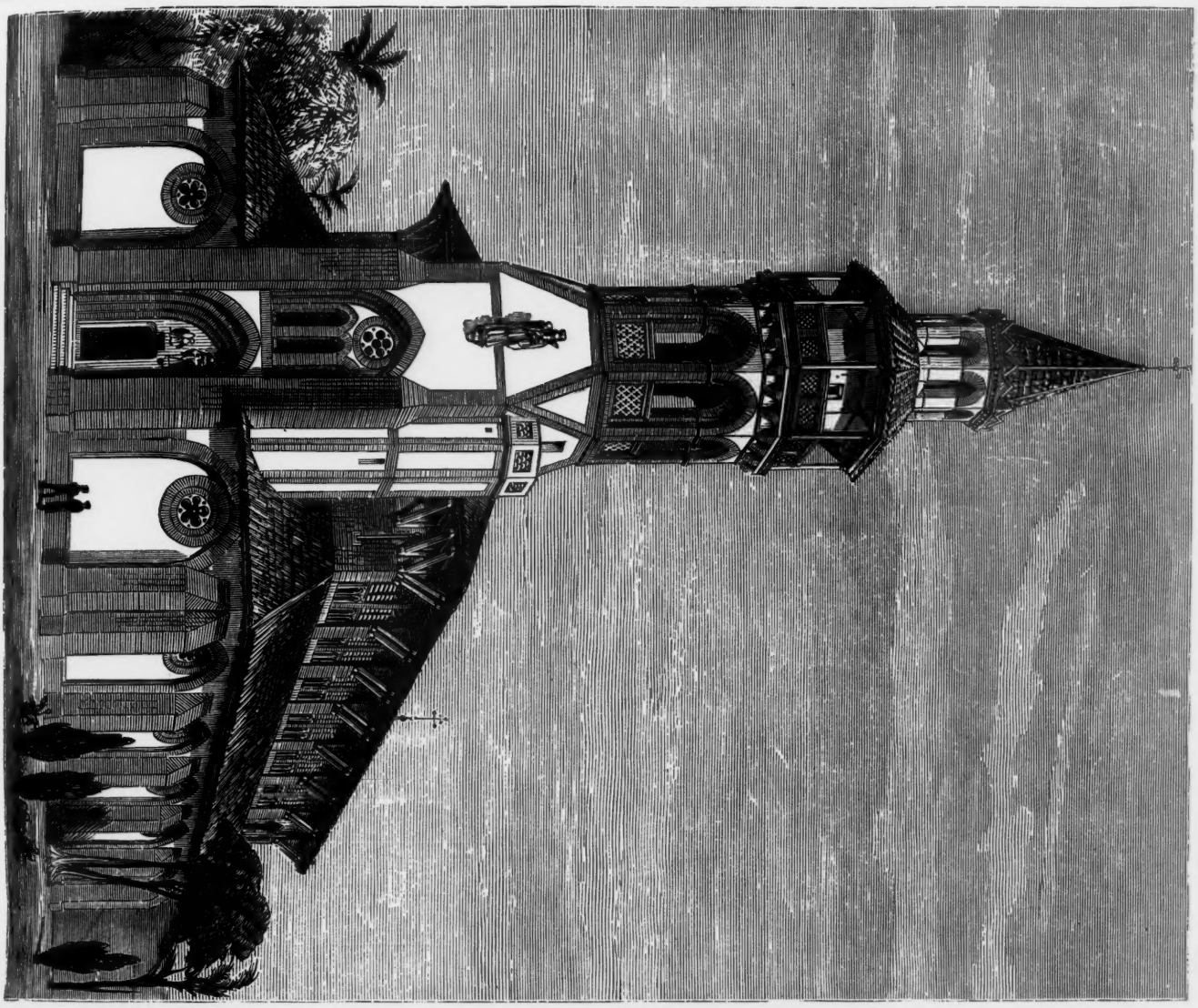
From broad walks and observatories surrounding the roof, and readily accessible by the elevators, the guests enjoy a panoramic view unsurpassed.

This structure claims to surpass, not only in size but in grandeur, all the hotels in Europe or America; Mr. John P. Gaynor was its architect, and it is called, not without some reason, the PALACE HOTEL.

Geological Changes in Greece. — At a recent meeting of the Geographical Society of Halle, Professor Hertzberg read a paper on the old and new conditions of the Balkan Peninsula. He pointed out how the upheaval of the shores of the Ægean Sea, and the alluvial deposits of the rivers, had reclaimed considerable tracts and altered the configuration of the country. Miletus, once an important port, is now a miserable inland village; and the Pass of Thermopylæ, which formerly was defended by a handful of men against a host, owing to the narrowness of the passage between the steep face of the mountain and the maritime swamps, has now widened to the extent of a mile seaward. Regarding the ethnographical changes, the Professor remarked that the Islamite and Greek religions had made many converts of people, and even races, whose origin was far different from what their creed would have denoted. The term "Greek" is often applied at this day to people who are nothing but Grecised Bulgarians.



THE PALACE HOTEL, SAN FRANCISCO.—MR. JOHN P. GAYNOR, ARCHITECT.



THE PROPOSED (R. C.) CHURCH FOR D'URBAN, IN THE DISTRICT OF NATAL, SOUTH AFRICA.—MESSRS. GOLDIE & CHILD, ARCHITECTS

CHURCH FOR D'URBAN, NATAL, SOUTH AFRICA.

THE church which we illustrate is to be erected for the Catholic population of D'Urban in the district of Natal, South Africa. The design has been made by Mr. Goldie, under the instructions of Dr. Jolivet, the Catholic bishop of the district, and is adapted to the climate and locality. The material is brick, partly covered with plaster or rough cast. The clearstory windows are filled with thick glass louvres. The circular openings in aisles will not be glazed, but will have metal fillings. The eaves project, with the object of shade. Cast-iron columns are to support the nave arcade, as stone can only be sparingly employed. The nave has below the roof a wooden ceiling, panelled in each bay. The floor will be in a kind of cement with air-channels for ventilation. The total external length of the church will be 113 ft. by a total width of 51 ft. The leading idea in the design has been to combine simplicity and economy with a certain Oriental character, in which the Pointed arch remains a distinctive feature. The architects are Messrs. Goldie & Child, of Kensington-square.

THE BATTLE OF PROPORTION.

"Truth, like a single point, escapes the sight,
And claims attention to perceive it right."
POMFRET.

LET the result of an inquiry into proportion be what it may, of this I am certain,—that the ancients designed and arranged their beautiful buildings upon a strict geometrical basis, and as they were eminently successful, it is not only to our interest, but our duty, to discover their principles and to enunciate them. Whether it be desirable or practicable to apply the ancient geometrical system to modern buildings and present uses is another question, and a serious one. Our religious observances are not those of past times; our materials are different; the introduction of iron roofs and ironwork generally, of course, call for a different treatment to that of stone. Glass, terra-cotta, and a host of modern inventions have to be considered. To retain one style of architecture is not in accordance with the perpetual flux as ordained.

"Nature knows
No steadfast station, but ebbs or flows:
Ever in motion; she destroys her old,
And casts new figures in another mould."—OVID.

Thus, "the world itself is ever young, but its transitory scenes pass swiftly by. Men come, men go, eager as in a race; each stretches forth his hand to seize the torch of life."—*Lucretius.*

Few will deny the importance of the study of proportion; students may rely upon there being no royal road to geometry. Its study is by no means a favourite with those who cannot draw or delineate with thick lines, or who are short-sighted. The subject has met with more favour from the amateur than the architect. Unfortunately, however, the amateur not being a practical man—plans, sections, and details being enigmas to him,—the elucidation of proportion has made no progress from his efforts. The architect fashions matter actually into parts, whilst the amateur only proceeds mentally. Art consists in practice and theory. Theory is common to and may be known by all, but the result of practice occurs to the artist in his own art only.

As an illustration, Mr. Cave Thomas, lecturing on "Architectural Proportion," says, "It does not satisfy the exigency of scientific inquiry (though if it were proved that certain famous structures were conformed in some way to the circle, the square, and the equilaleral triangle) to be told that they were so conformed because these are the most perfect figures. We require to know why those figures have claims to be considered more perfect than the ellipse, the parallelogram, or any less regular triangle." Alison has explained why an equilateral triangle is more beautiful than a scalene or an isosceles, a square than a rhombus, a hexagon than a square, an ellipse than a parabola, a circle than an ellipse. He says, "because the number of their uniform parts is greater, and their expression of design more complete. In general, in this subject, regular figures are more beautiful than irregular, and regular figures of a greater number of parts more beautiful than the same figures of a smaller number of parts: they cease only to be beautiful when the number of their parts is so great as to produce confusion, and of consequence to obscure the expression of design." And Mr. Thomas further observes "that a science of proportion should be established on a more satisfactory basis than precedent." On the latter point Sir Walter James's opinion (a well-known art amateur) is more correct. In a letter, in 1854, he says, alluding to my works on the connexion of architecture and geometry, "I apprehend that the most perfect architectural beauty was invariably found in accordance with correct geometrical proportion. This is a matter of fact which, of course, can only be decided by reference to strict data and historical antiquity.

Regular and symmetrical figures are of greater value to the architect than oval and elliptical forms, however pretty the latter may appear to the eye of the painter. The reason why the equilateral triangle and square have a preference is on account of their constructive properties, of which the amateur knows nothing.

Vitruvius asserts that if the point of a pair of compasses be placed in a man's navel, and his hands and feet extended, a circle or a square described will touch his fingers and toes, "by attention to which the ancient painters and sculptors obtained so much reputation." The Classic artist must have been no adept in free-hand drawing if he were compelled to resort to such a mechanical process of drawing. The application of geometry to an existing object is one process, but to create by geometry a beautiful building is another. Consequently, the architect ranks before the painter and sculptor as an inventive genius.

As a rule, writers have insisted that no positive proportions regulated the designs of our ancient architects, as works of nearly the same date, manifest such an extraordinary variation in their proportions. One London professor declared proportion to be a mighty and important question, and another proclaimed it to be positively cruel to torture the plans of old churches by geometry; and a popular writer says that proportion was dull, to say the least of it. However, on this subject, as upon many others, doctors differ; in 1734, Morris published lectures on architecture, founded upon harmonic and arithmetical proportions, designed "as an agreeable entertainment for gentlemen." This sounds anything rather than dull.

The principles of proportion have still to be enforced; there are many who have spent years in studying mathematics, and have never been able to apply the science to a useful purpose And it must be recollected that the subject in former times occasioned much discord. The disputes on the great question of proportioning the cathedral at Milan, 1387-1392, by the foreign system of squares, or by the native theory of triangles, have been noticed in Gwilt's Encyclopædia, 1867. In this instance thirteen artists declared that the church should be raised on the triangular proportion, and one artist was dismissed for holding a contrary opinion.

The system depending on the equilateral triangle continued in use till the beginning of the fifteenth century in France, when it underwent a great and important change by the introduction of the isosceles triangle, and its compound the pentagon, called also *pentalpha.* This unfortunately led to actual murder. A pupil of Berneval, the designer of the church of St. Ouen at Rouen, proved that these figures could furnish novelties in design; and the master was so incensed at the clergy preferring the rose-window of the northern transept executed by his pupil, where this innovation was first introduced, to that of the south, of his own execution, upon the ancient triangular system, that in a fit of jealousy he killed his rival, and was himself condemned to be hanged! Let this story be true or not, it proclaims the existence of a geometric system.

Even in 1099, a certain Bishop of Utrecht was killed by the father of a young Freemason, from whom the prelate had extracted the mystery of laying the foundations of a church. These Masonic jealousies were not limited to the Continent; the well-known story of the "'Prentice's Pillar," in Roslin Chapel, among others may be alluded to. The master mason, being unable to execute this pillar, went to Rome to see one of a similar description there. During his absence, his apprentice proceeded with the execution of it, and the master on his return finding the column as we now see it, killed his apprentice on the spot with his mallet. "As the pen now supersedes the sword," the different opinions on architectural proportion can be combated without such serious results.

In 1847 an angry conflict with the pen took place in the *Builder* between Mr. John Browne, of York, and Mr. Chantrell, which will be hereafter noticed. In 1853 another encounter occurs in the same journal, between myself and Mr. White; and, in 1855, a skirmish at the Institute of Architects may be noted on the part of Mr. Hay and Mr. Papworth.

In 1521 Cæsar Cæsarianus added to his edition of "Vitruvius" a plan, section, and elevation of Milan Cathedral, set out by the square and equilateral triangle. This Mr. Hawkins accidentally discovered in 1813; he first finds a *curious geometric print,* gives chase, and ultimately succeeds in securing the above work. He considered the volume so scarce, that, besides his own, there were but two copies existing in this country. There are, however, many copies extant. Mr. Hawkins's discovery was a genuine one, so far as it goes, but it gives a very limited portion of the great Mediæval geometric system. The plan of Milan is arranged on the square, and the section and elevation on the triangle. "If," remarks Carter,* "by this geometric scheme Mr. Hawkins can in reality discover any clue to ascertain the positive principle, whereby the relative heights, widths, and bearings of the main parts of the Milan edifice are determined, he certainly has the benefit and satisfaction all to himself, as I cannot, and, I may predict, not one of his readers, discover anything of the matter. A random laying down a number of inclined lines on an elevation, a mere scramble in the dark for professional points and bearings; a few, of course, are gained; but the greater quantity of them are non-effective, and of no use whatever." Hawkins simply gives Cæsar Cæsarianus's drawings of Milan Cathedral, proportioned by equilateral triangles, and consequently is not answerable for their effectiveness. Carter's opinion on this subject is valueless; he informs us "that no positive proportions regulated the designs of our ancient architects, as works of nearly the same date,—Westminster and Salisbury,—manifest such an extraordinary variation in their proportions." This objection is explained away by the fact, that the sections and elevations of Westminster Abbey are designed by the equilateral triangle, and those of Salisbury Cathedral by the square.

Vitruvius had no knowledge of Gothic architecture: hence the folly of Professor Cockerell† attempting to prove the contrary, because Cæsar Cæsarianus inscribed the geometrical schemes for proportioning Milan Cathedral in his edition of Vitruvius in 1521. The Professor's attempt to proportion by geometry the chapels of Wykeham at Oxford, was a complete failure; and, as the *Ecclesiologist* observes,‡ "There is an indefiniteness in the statement of the rules, as well as the arguments on which they seem to rest, which fatigues the mind, or drives it from very weariness away from the subject."

In 1525, Albert Dürer, in his "Geometry," sets forth rules for proportioning the details of Mediæval architecture, and is the first to re-introduce the *vesica piscis.* In 1817 and 1819, Kerrich§ very successfully applied this figure to the plans and minor portions of Mediæval buildings; he gives no elevations or sections. Mr. John Browne, in 1828; Mr. Billings, 1840; Professor Cockerell, 1845; Mr. Chantrell, 1847, and Mr. White, 1853, availed themselves of Kerrich's application of the *vesica piscis.* Now, as I pointed out in 1847,‖ the *vesica piscis* is an oval produced by the intersection of circles, but the equilateral triangle and its multiples form the kernel. The circle, or *vesica piscis,* as a nutshell, containing the multiplication of regular figures, is very well as far as it goes; it is the *kernel,* however, to which we must look for potent effects; and what can be more beautiful than an equilateral triangle, either as a simple figure, or as a symbol of the Trinity?

Mr. Billings, Mr. Cockerell, and Mr. Chantrell acknowledge Kerrich, directly or indirectly. Not so Mr. White; he applies the *vesica piscis* freely, and the equilateral triangle, and says that he had not seen any of my works until his arguments and diagrams had been drawn out, and was not even aware of the existence of Kerrich's paper. In 1849, a paper was read at an architectural society "On the Principles of Architectural Proportions," by the Rev. ———, who observed the singular and undesigned coincidence by which several indi-

* *Gentleman's Magazine,* vol. 85.
† Archæological Works of William of Wykeham, 1846.
‡ Vol. vi., p. 226. § "Archæologia."
‖ "Ancient Gothic Churches."

viduals had arrived at the same conclusions on this subject; and a short time after, a letter from the secretary stated that the lecturer used my diagrams and theory! How widely different from this clandestine kind of conduct has been that adopted by the Rev. P. Freeman in a paper read at the Cambridge Architectural Society, 1848; and Mr. Fowler Jones, at the York Philosophical Society, 1849. If each investigator would resume the inquiry from where the last one left it, and properly acknowledge that which has been previously worked out, something more tangible would be realised, and the better appreciated.

In a letter to Mr. Cresy in 1847, I observed that "the importance of the application of regular figures in architectural construction, not in merely arranging parts, but in positively deciding the construction of actual buildings, has been enforced by me for many years. It is a matter of pleasure to me, after having devoted years in endeavouring to obtain some one to coincide in opinion, to find now many earnestly engaged in its study. There have been several attempts made by Mr. Billings and others in showing a centre here and there; but no one has ever laid down the subject systematically, and devoted works solely to the subject, except myself. Mr. D. R. Hay, whom you mention, is a house-decorator in Edinburgh: consequently, not being an architect, he has not produced anything practical. He took from me, without acknowledgment, my three primary figures bounded by the circle,—viz., the equilateral triangle, square, and pentagon;* Mr. Hay having formerly maintained that the circle, triangle, and square were the primary figures.† And in one work he borrowed from the "Geometrical Proportion of Grecian Architecture,"—of course, without acknowledgment.

In 1848, I addressed a letter to the "Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels," in which their attention was directed to the necessity of making themselves "acquainted with the construction of Gothic edifices as based upon the geometry of regular figures, in order that they may be enabled to test and to judge the nature of all designs submitted for proposed new churches, and more particularly with respect to any enlargement or reparation of our ancient churches; that the said alterations or additions may be effected thereto in keeping with, or corresponding to, the proportions existin the churches proposed to be altered. The numerous sums of money which have been innocently voted for the spoliation of our ancient churches is surprising, and the ignorant prejudice of some architects to the introduction of any settled rules, whereby architecture may be raised to the position of a science, is equally to be regretted. If you require from an architect a design for a church, he will probably ask what period of Gothic architecture you desire for it; and presuming you chose the 'Decorated,' he refers to his examples and specimens, and takes a door from one church, a window from another, and a column from another, and then amalgamates his materials without the slightest idea of proportion; in fact, the architect who has been the most successful is the one who has *copied the most closely*. Many of our new churches exhibit profound ignorance on the subject of design. I frequently see existing in one church three different periods of art."

In 1849, in answer to an inquiry from Dr. Whewell, I remarked to him that, "in reply to your letter as to 'whether my attention has been drawn to some papers of Mr. Kerrich in the "Archæologia," containing somewhat similar views published thirty or forty years ago,' I beg to refer you to the first part of my 'Ancient Gothic Churches,' p. 10. As you may, perhaps, not be able to lay your hand upon that part without loss of time, I will quote the observations:—'When Mr. Kerrich's‡ paper was published on the use of the mysterious figure, called *vesica piscis*, he discovered *the nutshell*, but *the kernel* he has left for us to unfold. The *vesica piscis* is an oval produced by the intersection of circles; for instance, in plate 3 (the plan of King's College Chapel, Cambridge) are seven of them; but the equilateral triangle, and its multiples, as exemplified in plate 3, figs. 1 to 5, form the kernel. The circle, or *vesica piscis*, as a *nutshell*, containing the multiplication of regular figures, is very useful as far as it goes; it is the *kernel*, however, to which we must look for potent effects, and what can be more beautiful than an equilateral triangle, either as a simple figure of form, or as a symbol of the Trinity? Mr. Kerrich has shown two or three analogies, not as a system, but suggestive; and Messrs. Cresy, Billings, and others have illustrated a point; no one has submitted a perfect system, nor any system, except myself. The connexion, also, between architecture and music, I believe, has not been attempted by any one else. In 1843 I published a work entitled "Geometrical Proportion of Grecian Architecture"; and in 1845, "The Natural System of Architecture," &c. In these works the architecture of the Greeks was proportioned in a perfect manner, and a system suggested and propounded, in which I set forth three primary figures of form, viz., the equilateral triangle, the square, and the pentagon, and showed their sundry workings in producing Greek and Gothic architecture. I believe on the subject of geometrically proportioned Greek architecture I am not only the first but the only one. With respect to Gothic architecture, I have delineated the method of producing in a perfect manner, by geometry, a plan or a section, and even details. The discoveries which I have made have been deduced from an analysis of the actual admeasurements of Greek and Gothic buildings, the former given by Stuart and Revett and the latter partly from Britton's works and from my own measurement. It is pleasing to me to hear of any writer who may have touched upon the subject, as it seconds my endeavours. Notwithstanding the several hints upon proportion in books, it never has taken a practical turn or shape until my re-introductions.'"

In 1849, Archdeacon Hale, in a letter, truly observed that "I think it quite within possibility that the gift of architectural skill may be possessed, like that of music or painting, or number, without the artist being himself aware how all that he does is in its parts proportional. The converse is certainly true that they who are defective in architectural skill are the last persons to suspect that their failures are from their own ignorance, either of proportion or of the means of applying it. One of the best exercises which a young architect could perform would be that of tasking himself to discover of any work, commonly said to be beautiful, how it differs from others like it, but which do not produce the same effect. They would be surprised at discovering how rapid is the transition from beauty to deformity; and they would learn that in works of stone, as in the human form, the slightest change in the proportion produces at once loss of beauty."

In the works of nature beauty is seldom found without utility, but in the numerous essays on proportion and beauty in architecture, propagated by Mr. Hay, Mr. Jopling, Mr. Penrose, Mr. Watkiss Lloyd, Mr. Cave Thomas, and others, there is a total absence of practical results.

In 1823, Mr. Jopling published a "Septenary System of Generating Curves by continued motion." He says that "eighteen years' experience in civil architecture enables him with certainty to state, that those persons who are practically engaged in Gothic works will find the principles of the septenary scale of the greatest importance in generating curves for arches of large dimensions. He is convinced that any person who may have made himself acquainted with those principles will never again attempt to form a Gothic arch by ordinates, by intersections of right lines, or by putting together sweeps of different circles." Mr. Jopling gave no illustrated proofs, and if he had, they would have ceased to be Gothic. At a later date, and in 1844, Mr. Jopling issued a further exposition of his system by double cranks with illustrations, but they were wholly useless as far as Gothic architecture is concerned. In 1848 I called his attention to this point, and stated that, to render his labours useful, they must be made to assume a practical shape, and the curves applied to tangible purposes; to this Mr. Jopling demurred, and wrote in reply, "I beg to thank you for your suggestions; which, if I was able to accomplish, but which I am not, I feel convinced, from long consideration, that they would not answer the purpose I contemplate, as you suppose, but tend to retard it. What would you think of the individuals procuring materials leaving the quarry and forest to instruct builders how to apply them? Besides, would it not be an insult to architects and artists if they had numerous well-arranged correct examples of mathematical lines placed before them, which they could study, compare, and reproduce to various scales, and combine in designs, to suppose that they could make no application of them, without the way being pointed out? Can they derive ideas of forms from leaves, &c., and also appropriate them, and even think they can discover geometrical rules for perfecting them? How, then, can it be supposed to be necessary for professors as well as students to be instructed to apply true and beautiful mathematical forms, when both the laws and apparatus for their production, as well as the lines, are proposed to be placed before them?" However singular it may appear, it is undoubtedly necessary that professors should be instructed how to use Mr. Jopling's cranks; the more so, as he could not apply them to any useful purpose. The same may be said of mathematics. Dr. Lamotte, in 1730, observes that though you were to read a proposition of Euclid a thousand times over to a scholar, he will be as much at a loss as he was before; but show him a figure, and delineate a plan, then all difficulties vanish, and everything is clear and plain.

The extraordinary disbelief of geometrical proportion by architects engaged in designing some of our largest churches is exhibited in the following extract from a discussion at the Institute of Architects, March 19th, 1860:—"Mr. Street believed there was no building extant which could not be reduced to the principle of either the square or the triangle." Now, the real truth is this, that no building whatever can be successfully tested by geometry that has not been based upon the square or the triangle. And one of the strongest proofs which can be urged is this, that in nearly all *accurately measured* Mediæval edifices, the geometric test will apply, and only fails when the drawings are not correctly delineated. For example, apply the triangle to a bay of the nave of Westminster Abbey, and six triangles exactly mark its height; then test the same bay, inaccurately shown in Gwilt's "Encyclopædia of Architecture," p. 986, 1867, and it does not apply at all.

Without extreme accuracy of measurement, no reliance can be placed upon geometrical proportions. In Cresy's "Treatise on Bridges, Vaults, and Arches," plate 65, five equilateral triangles decide the height of a compartment of Wells Cathedral; by comparing this with Britton's plate 7 of the same compartment, it does not coincide, although both are from alleged actual admeasurement.

The subject of geometrical proportion is now being introduced into our architectural encyclopædias and dictionaries, but unfortunately not in a truthful and concise manner. In Gwilt's "Encyclopædia of Architecture," 1867, are many pages on Proportion, by Edward Cresy, transferred from his "Encyclopædia of Civil Engineering." Instead of proportioning the tetrastyle, hexastyle, and octastyle temples of Greece from actual measurement in the accurate manner set forth in my "Geometrical Proportions of Grecian Architecture," 1843, Mr. Cresy takes a square and a half as the form to comprise a hexastyle portico, and a double square for an octastyle portico. No further remark is necessary here than the fact that there are no Grecian temples on record which approach in measurement such an assumption. The able editor of Gwilt's Encyclopædia (edition 1867) admits that "the idea is now generally sanctioned that the Mediæval architects had some settled system of proportioning their designs either by simple geometric forms, or by combinations of them." This is a move in the right direction, as for many years past it has been maintained that the Gothic presents the most ridiculous proportions, with details formed without rules or order.

Mr. Cole, in 1847, alluded to Boston Tower, Lincolnshire, being proportioned by the square and its diagonal; and Sir G. G. Scott, in 1859, stated that in an old work of the Freemasons it is said that good proportions may be obtained from the square, but better from the triangle, and that another proportion, common in old works, is derived from the diagonal of the square. The fact is, that the diagonal of the square is not another system of proportion, but is deduced from the square, upon which it is dependent. In any given square, if the diagonal be divided into seventeen equal parts, twelve will form each side of the square. Then if the diagonal be placed perpendicularly, the base or width of the square has twelve equal parts, and

* See the *Builder*, vol. v., p. 170, 1847.

† In 1837, Mr. John Bennett, engineer, gives the circle, square, and triangle as primitive geometrical figures, in his work entitled "Original Geometrical Illustrations."

‡ "Archæologia," vol. xix., 1821.

its height seventeen parts; but then the five parts above the regular square are component parts of the original square, and commensurate with it.

In conclusion, because rules and systems can never reach every possible case, is no argument for despising them. The fundamental error of imitators in all arts is, as observed by Payne Knight, that they servilely copy the effects, which they see produced, instead of studying and adopting the principles which guided the original artists in producing them.

W. PETTIT GRIFFITH, F.S.A.

ANOMALIES IN ARCHITECTS' PRACTICE.

SIR,—I looked last Saturday for some remarks in reply to Mr. Roger Smith's letter on this subject, but having looked in vain, I write these lines in order that a statement of matters so worthy of consideration should not be suffered entirely to drop.

1. Mr. Smith objects to the provision in ordinary contracts that orders for extra work shall be in writing, because of the practical difficulties the architect finds in conforming to this rule, and suggests its replacement by a provision that the builder shall have no claim, on the final settlement of accounts, for any extra work, unless he have made a claim in writing for such work in the week when he says the order for it was given.

2. He remarks with displeasure upon the frequent,—in his experience, indeed, universal,—neglect to enforce the "penalty" for overtime, and to assist in ensuring its enforcement suggests "some plan for extending the time in proportion to the amount of added or varied works."

3. He objects, finally, to the uncertain position the bill of quantities holds in a contract, and appears to hint at its confessed embodiment in the contract.

As to the first remark, I must needfully admit the watchfulness and trouble called for to ensure written orders being given for all extra work. Being human, like my "brethren," I should also needfully rejoice in any suggestion for the reduction or obliteration of that watchfulness and trouble. A written record of extra work, acknowledged by both builder and architect, being at the same time that which has to be secured, I do not see how watchfulness on the part of the architect is to be avoided; and as to the trouble, whatever device may be suggested to avoid that, I cannot think that a device which, like Mr. Smith's, could throw it on the builder, would prove desirable, or in the long run workable.

Reserving the second subject in Mr. Smith's letter for my final remarks, I turn to the third. Here, again, if we are careful to have it understood by all who tender, that the quantities are taken out by the quantity surveyor on his sole responsibility, the contractor will be bound to erect such a building as appears in the drawings and specification, irrespective of the quantities; and the quantities will become evidence only of how the surveyor understood the drawings and specification, and in this position, except in rare cases, it appears to me it is most desirable to leave the matter.

The second subject in Mr. Smith's letter opens a most interesting field of inquiry. Mr. Smith's suggestion would provide for extra time being given in consideration only of added or varied works; but surely as a rule much more than this is meant and understood. The delay caused by strikes is now openly provided for, and sometimes that which may result from bad weather. The contract for completion within a definite time appears to me, indeed, really to mean that the contractor shall use reasonable and due diligence to so complete, and I feel justified in thus interpreting the contract from the habitual non-enforcement of the "penalty" for overtime.

If we accept this account of what is intended, I can see no way of carrying out the intention with any efficiency, except by having a definite time for completion, with penalties for non-completion, and the waiving of those penalties whenever reasonable ground for such waiving exists. Practically, I admit that in the case of building contracts the penalty is most rarely enforced, but it is used as a spur,—dull as that spur may have become,—all through the contract. If the time is exceeded, the penalty incurred also is a by no means inefficient power in the settlement of other disputes, if such there are, and, unlike Mr. Smith, I have known a part of the penalty enforced in more cases than one.

While thus arguing, I quite feel, with Mr. Smith, the great objection to saying one thing and intending by it another,—to saying definitely a work shall be completed by such a time under such penalties for non-completion, and meaning only that due diligence shall be used. The practice, however, of saying one thing and meaning another is not (among matters which come immediately under our cognisance) confined to building contracts. The repairing covenants in a long lease are very similar. While providing definite penalties, even to the forfeiture of the lease, for the slightest non-performance of its covenants, the lease (in most cases) so far from meaning what it says in its bare harshness, simply intends that due diligence shall be observed in keeping the fabric in repair. The division between law and equity, with which we are all familiar, is indeed an outcome of the infirmity in our nature which compels us to make engagements with each other of the most definite kind when read in the letter, while in the interpretation of the very engagements we have found in common use, we have to find relief from the letter by reading them in the spirit. "Equity," says Blackstone, "in its true and genuine meaning, is the soul and spirit of all law." To sum up generally these remarks on Mr. Smith's interesting letter, I would say, Let us amend our practice as may be needful rather than change the instruments to which use has accustomed us.

HORACE FIELD.

SIR,—Referring to Mr. Smith's letter in your issue of Sept. 7th, and seeing that no professional brethren have up to the present thrown any light upon it, we desire to make a few remarks upon the subject, as the gist of the matters in question very seriously affects the interests of the builders generally.

We cannot see, with reference to the first inconsistency called attention to, that there should be any reluctance on the part of an architect to give orders for extra works as they occur, without the builders having to press for them, as he should best know what actually constitutes an extra. It is well known that builders have difficulty in obtaining written orders, and in many cases this arises, we have observed, from the fear some architects exhibit of properly asserting their position in determining them; but we would ask of your correspondent, supposing the builder first seeks written orders for extra works (verbally ordered), and fails to get them, and he then, as suggested, supplies weekly day-sheets in duplicate, which are never acknowledged or returned; and then, when the contract is completed, they are disputed, where is the builder's remedy, but through the very unpleasant, tedious, and uncertain decision of law or arbitration?

As to the question of time of completion, it is assumed by your correspondent that builders in general are never fined for non-completion to time. Our experience tells us that fines have been often enforced by the client, through his architect (if not actually by the architect's wish); and with reference to a pecuniary loss falling on the architect himself, we have found builders very loth to ask an architect to pay out of his own pocket for any omission or discrepancy caused by him or the errors of his assistants.

Whilst on the question of delays, in what position does the builder stand if works supposed to be completed by agreement in six months, and which really occupy twelve, and the supervision, foreman's wages, &c., costing double the contemplated sum, if that delay is caused by the negligence of the architect in supplying such information and documents as are necessary for conducting the work?

As to quantities, our experience tells us that they are as often repudiated as acted upon in a final settlement, according to which way, in case of dispute, they work best for the client; but as the drawer of all agreements and papers, &c., referring to a contract is the architect, it is in his own power to determine them to be or not to be part of the contract, and it should be so laid down.

A FIRM OF LONDON BUILDERS.

A Statue of Humboldt, cast in the Royal Foundry at Munich, is about to be forwarded to St. Louis, United States, the gift to that town of Mr. Henry Shaw, who last year presented it with a Shakspeare memorial. The sculptor is Herr Ferdinand von Miller.

ON THE MATHEMATICAL THEORY AND ART TEACHING.

SIR,—Man himself is, when he is at his best, the most perfectly constituted mathematical instrument to subserve the purpose of taste. He is, from the fundamentally quantitative nature of his experience intuitively a ratiometer, *par excellence*, the æsthetic measure. The Americanism "I calculate" expresses a literal truth. Man is a calculating-machine, the more or less perfect as his nature is either in or out of gear, as it is either perfectly or imperfectly developed. It was, doubtless, a certain dawning of this important truth that led Michelangelo to admonish a student that he ought to depend on the compasses of the eyes rather than on those of the hand; for the great master full well knew that if the æsthetic compass were not in the student's nature, the callipers would be of very little use. Excellence can alone be attained in the fine arts, as in everything else, by perfecting the instrument of thought,—the humanity. It is to this end that educators should, before all else, direct their attention. If they would care for that main purpose they need take no thought about museums of casts, or about the future of art. Everything would be evolved in due order.

It is to curves of varying gradation, rather than to the regular and more mechanical geometrical curves, that the cultivated human nature inclines, and the attempt to force children and students into drawing regular geometrical figures, to which the mechanism of their frames and of their senses is not adjusted, is one of those mistakes into which *dilettanti* art-reformers inevitably fall. Architecture certainly stands apart as a kind of a crystalline structure, which, having no counterpart in external nature but the rocks, is, to a great extent, a compilation of geometrical forms; and nothing can very well show the more simply mechanical nature of architecture, as compared with either painting or sculpture, more than the fact that the carcass of the Parthenon might be exactly repeated by a mason skilled with rule and compass. Not so, however, the pediments and friezes of that structure, which would require a skill, even to faintly approach them, of a higher and subtler kind. Creative nature and fine taste delight in curves of more varied motive than the regular geometrical ones. The orbits of the planets and the curves of growth are not circular. Good taste selects the oviform in preference to the constancy of the curves of either the circle or of the ellipse.

We moderns have more complete mechanical appliances for the reproduction of art than the ancients. The Greeks had no mechanical aids to facilitate the production of sculpture equal to the "pointing machine," and even in the Cinque Cento the Italians had nothing but the rudest of contrivances for the same purpose; and yet we are behind both. The painter of the present day, too, can bend photography to his assistance. But you shall find it a law of human nature, that, as you multiply external aids, native energy and skill decrease. This is a matter which should be taken to heart. For all the higher purposes of art we should, as much as possible, rely upon the unaided human nature: go-carts make the humanity rickety. For all art purposes, no mechanical contrivance can compare with the delicacy of the perfect human eye under the control of the fully-developed intellect. Fine-art is the result of common sense, of correct, not erratic thinking. We English seem to think that taste and art are to be evolved by multiplying ancient examples, and leaving out the thinking, unless this be of the very "fluffiest" kind.

W. C. T.

THE GREAT NORTHERN NEW GOODS STATION, FARRINGDON-ROAD.

THE works at the extensive and costly goods station for the Great Northern Railway Company, in Farringdon-road, which have been in progress during the last five years, are now drawing to a close, the completion of the last section of the immense block of warehouses having just been effected, with the exception of the internal hydraulic machinery, which is now being placed in the building, and the whole will be opened for the business of the company in about a month from the present time.

Inclusive of the heavy amount of excavation and the underpinning which was required previously to the commencement of the erection of

the warehouses, the work has been one of the heaviest engineering undertakings of its kind in the metropolis. The block of warehouses has a frontage to Farringdon-road of 300 ft. in length, the Charles-street frontage at the south end being 135 ft. long, the building extending northwards beyond the boundary of the Metropolitan Station, but narrowing in width, the north frontage of the warehouses being reduced to 50 ft. The warehouses thus occupy a ground area parallel with Farringdon-road of about 28,000 superficial feet. Independently of the basement, which is 23 ft. below the street line, and where the chief business of the depôt is carried on in the despatch and arrival of merchandise by the Metropolitan Railway to King's-cross, there are two lofty stories above the ground floor, and as the basement is of the same dimensions as the three floors above, the building, contains an aggregate floor-space of about 112,000 superficial feet, or between two and three acres in extent, in addition to the large station-yard at the south end, from which the basement is approached by an inclined plane, and where stables for the company's horses have also been erected. The warehouses are 60 ft. in height from the street line, and the elevations are slightly ornamented. Each floor of the Farringdon-road frontage contains a range of twenty-four windows, with three wider entrances for lorries. The main face of the elevation is in Burham wire-cut white brick, the window-jambs, string-courses, and panelling, immediately under the main cornice, being in Pether's pressed brick, whilst the arches of the windows are in red cut brick, surmounted by a blue brick string-course.

The floors and other portions of the interior are for the most part of iron. No less than 3,000 tons of wrought and cast iron have been used in carrying out this portion of the works, including sixty tons of cast-iron trough girders, and thirty-five tons of cast-iron columns for the ground-floor above the basement. Messrs. Westwood & Baillie, of the Isle of Dogs Iron Works, have supplied the ironwork, the floors throughout being laid with Westwood & Baillie's patent corrugated truss flooring, which are the first floors of this description which have been laid down by the patentees. The hydraulic machinery throughout the warehouses forms a prominent feature in the buildings. This machinery consists of thirteen hydraulic cranes in the basement alone. Two of these cranes will lift three tons each, and the remaining eleven 30 cwt. each. There are also four capstans, of fifteen horse-power each, together with wagon-hoists for lifting wagons from the basement to the ground-floor. These hoists will lift a wagon of 25 tons' weight. There are likewise two large hydraulic lifts, one at the south end and another at the north end, for lifting merchandise from the basement to the upper story of the warehouses, a height of more than 60 ft. These lifts will raise and lower two tons' weight each. In addition, there are also four jiggers, each of which will lift 10 cwt. from the basement to the top of the building. It may be added that there are ample facilities for the reception and delivery of merchandise, not only by the inclined road on the south side leading down to the basement, but also by the Farringdon-road and Charles-street entrances, and the yard and station area in the basement have space for 150 railway trucks, which can be worked at one and the same time.

The works are designed by Mr. R. Johnson, the Company's engineer in chief, and have been carried out by Messrs. Kirk & Randall, as the general contractors, Mr. Charles Randall, brother of one of the firm, personally superintending the works from their commencement to the completion. Mr. J. N. Thompson has acted as clerk of the works. Exclusive of the land, which the Great Northern Company had to purchase from the Metropolitan Company at an outlay of upwards of 40,000*l.*, the works now just on the point of completion have cost upwards of 100,000*l.*

A Narrow Escape.—With reference to the lamentable loss of the *Princess Alice*, Mr. Lowe, the surveyor to the Hampstead Vestry, and his wife and only child, who had gone for the day's trip to Sheerness and back, were amongst the few who left the boat on its return journey at Gravesend to come home by rail. Every friend of Mr. Lowe will feel thankful for the safety of a valuable public servant.

PARIS EXHIBITION AWARDS.

WE hear that amongst the Englishmen rewarded by the Exhibition jurors, Messrs. Doulton, of Lambeth, have received a *grand prix*, two gold medals and two silver medals. George Tinworth, one of their artists, has been rewarded with a silver medal for his terra-cotta group. Minton has had a *grand prix*, and Worcester a gold medal. Messrs. Jas. Stiff & Sons are said to have received two medals, the character of which has not reached us. Messrs. Clark & Co. have received a silver medal for their noiseless steel shutters; Messrs. Dunnill & Co., of Jackfield Works, have obtained a bronze medal; and to Mr. Harry Hems has been awarded "honorable mention" for sculpture and wood-carving under Classes 17 and 18.

THE LATE MR. ROBERT BOYLE.

THE death of this gentleman, which took place on the 2nd inst., at the age of fifty-seven, has elicited some strong testimonies in Scotland to his ability and energy. He appears all his life to have been devising and inventing. In 1854, Mr. Boyle opened, under the patronage and with the assistance of the Lord Provost and magistrates, and the leading temperance reformers of Glasgow, an Industrial Museum and Hall of Science and Art, being the first of its kind in Scotland. It was situated in the large building at the corner of Trongate and Brunswick streets, on the east side, and occupied three flats. Lectures were given nightly during the winter season, and three times a week during the summer, on all subjects coming within the range of science, and which would tend to promote the public weal. The scientific lectures were always illustrated when possible with experiments, the different apparatus for which Mr. Boyle usually made himself. He invented, after two and a half years' continuous application and experiment, a detonating powder, the power of which was something terrible, and yet it combined the greatest safety in handling and moving about, quite different from other detonating compounds. In combination with this powder he also invented an improved shell, but could not induce the Government to adopt either. He will be best known by our readers as the inventor of what is called Boyle's Patent Self-acting Air-pump Ventilator, and which, with the exertions of himself and his son, Mr. Robert Boyle, jun., has proved one of the most successful and useful inventions of the kind, and brought the subject of ventilation and the importance and absolute necessity of fresh air to sustain health strongly before the public. It is in general use, and is extensively employed by the Government.

Shortly before his death Mr. Boyle laid another invention before Government in connexion with war weapons, and which when first submitted was highly approved of, but was pronounced to have one defect, which, if overcome, would make it perfect. It was overcome and made as desired, but when again submitted, the usual intimation was received, "Not found suitable," &c. This, it is asserted, had a great deal to do with hastening Mr. Boyle's death. He died bringing out an invention which was to reduce the chances of explosions in mines to a minimum, and had succeeded in perfecting it. When remonstrated with by his family about taxing his brain so much, and warned that it would kill him, he made the reply, characteristic of the man, that it was better his life should be sacrificed, which was but one life, than that, perhaps, of thousands.

NEW MARKET BUILDINGS.

Huddersfield.—On the 5th instant, Alderman David Sykes, chairman of the markets committee of the Huddersfield Corporation, laid the corner-stone of the New Market-hall, which is being erected from designs supplied by Mr. E. Hughes, architect. Mr. Radcliffe, the contractor, presented the trowel, and Mr. Hughes presented the mallet and level to Mr. Sykes with which to lay the stone. After the stone had been laid with the usual formalities, Mr. Sykes gave an address, in which he pointed out the capabilities of the new building, and expressed the hope that by its means the people of Huddersfield would be able to buy produce as cheaply as they were enabled to do in Leeds and other large towns. The new building is to cost 23,900*l.*

Rugby.—The new cattle-market at Rugby was opened on the 10th inst. The site is near the railway station, and the market proper extends over three acres, and has been laid out from the designs of Mr. W. Stewart, the town surveyor. The market is provided with every convenience, and paved and drained throughout. It comprises settling-house, first and second class refreshment-rooms, iron pens for the accommodation of about 3,500 sheep and 2,500 beasts, with sheds for calves and pigs, and yards for implements and horses. Large water-troughs are provided for the animals. The cost, including the site, will be between 6,000*l.* and 7,000*l.*

COMMITTAL OF A BUILDER.

MR. E. CLARKE, a builder, of Pratt's-road, Hackney, was brought up on a warrant at the Worship-street Police-court, under the following exceptional circumstances:—Mr. Clarke, it appeared, had built eleven small houses in Pratt's-road, Hackney, about the commencement of the year, and Mr. Frederick Meeson, surveyor of the district in which such houses are situate, complained that they were not built in conformity with the requirements of the Metropolitan Building Act. Mr. Clarke not having complied with a notice of the surveyor to alter the houses as required, was summoned for breach of the Act. An order was made on the defendant to do the work required, but at the end of two months he was again summoned to the court for non-compliance with the order. He was then ordered to pay certain penalties provided by the Act, and amounting in this case to 25*l.* The money was recoverable by distress, and the officer (Allpress) received a warrant from the court to levy for the amount. He subsequently made a return that he had been unable to discover sufficient goods to cover the amount. By the terms of the order for the payment of the penalties, Mr. Clarke became liable to two months' imprisonment, and being now brought up in custody was ordered to be committed to Holloway Gaol (debtors' side) for that term.

"OVERTIME."

AT the Birkenhead Police Court, on the 13th inst., Mr. William Taylor, builder, Old Chester-road, Tranmere, was summoned before Mr. Preston, stipendiary magistrate, by four men lately in his employ, for the sum of 1s. alleged to be due to each of them. The men were John Cooke, John Williams, John Thomas, and Thos. Garner, joiners, and they were represented by Mr. Moore, while Mr. Hannen defended.

Mr. Moore said that the case was prosecuted in consequence of an infringement of Rule 6 of the Liverpool Master Builders' Association, namely, "All employers to commence to pay their men not later than ten minutes after leaving-off time. If not paid within half an hour, overtime to be charged." These men were employed by Mr. Taylor in July. On Friday, the 19th of that month, they received from the foreman joiner new time-sheets on which to mark their time, and on the back there was an intimation stating that after that date immediate notice to leave would be given or received on either side. Up to that time two hours' notice was required. The men objected to this, and they refused to fill up their time-sheets, considering the new rule an infringement of those under which they had hitherto worked, and that if they had used the sheets they would be bound by them. On the next day (Saturday), they would not fill up their papers, and thus a delay of an hour and a half took place, which constituted the time now charged for.

Mr. Hannen said that the new rule had been made because some time ago some men in receiving two hours' notice to leave went and smashed a number of things in the place.

Mr. Taylor said it was his rule to pay the masons first, and then the joiners; but on this occasion, when the latter came their time-sheets were not filled up, and thus a delay took place, for which the men charged as for time worked.

The case of Cooke having been heard to this effect,

Mr. Preston remarked that he did not think the men would be bound by the rule simply because it was printed on the back of the time-sheets. They worked a certain number of hours, for which they were entitled to a certain rate of wages, but to charge for the time occupied in expostulation was going rather too far. He dismissed the summons, and on being applied to on behalf of the Amalgamated Society of Carpenters and Joiners, to state a case for a superior court, refused the application.

Chester Cathedral Restoration.—Dean Howson, preaching at Liverpool on the 12th inst., alluded to the restoration of Chester Cathedral. He said the restoration had gone on from 1868 to 1876, during which period 90,000*l.* had been expended, including 10,000*l.* set aside by the Ecclesiastical Commissioners and 80,000*l.* collected. Of the 5,000*l.* still necessary for the completion of some details, 2,000*l.* had been collected, and 3,000*l.* was still required. As far as they could see, the River Mersey was likely to become the boundary between two dioceses. But Chester was still the cathedral of Liverpool. Apart from that, it should be preserved as a great historical monument associated with distinguished names in history,—royal names and ecclesiastical names during the period extending from 1100 to 1500.

NEW UNION BANK, GEORGE STREET, EDINBURGH.

THE new premises of the Union Bank of Scotland, at No. 64, George-street, have been opened for business. The buildings are in the Italian style, and have a frontage towards George-street of 100 ft., the greatest depth from front to back being about 140 ft. The most prominent features of the elevation towards George-street are three porticos, the centre one giving entrance to the bank proper, and those at the sides to the dwelling-houses above. These porticos consist of Ionic columns (the centre one having four and the others two), with pilasters next the wall, supporting an entablature carried along the whole front, and surmounted by a balustrade, which is repeated in the windows of the first floor. Over the doors are clam-shells and carved heads. The masonry between the street-floor windows is in courses,—vermiculated and plain alternately. The first-floor windows are flanked by pilasters resting on the pedestals of the balustrade, and supporting a pediment over the window, enriched by a shell. The second-floor windows are treated with architraves and moulded sills, and over these is the main cornice, supported by trusses, and crowned by a balustrade the full length of building, to the cope of which the height is about 62 ft., and behind which are the windows of an attic floor.

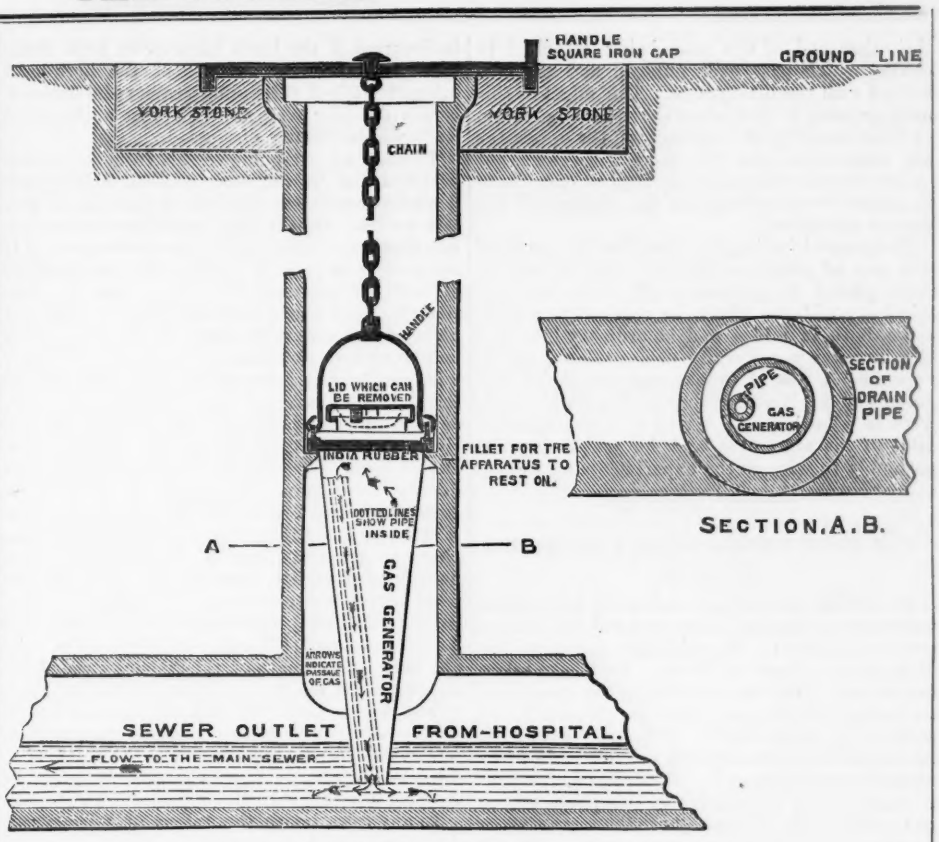
The street floor and the floor below are entirely devoted to the purposes of the Bank, while the three upper floors contain two dwelling-houses, which have been completed and occupied for some time, and to which entrance is gained by the porticos at either end of the George-street front. Entering by the central portico, and passing through the entrance-hall, the telling-room is reached, which is large and commodious, and well lighted from the roof, and also by a large three-light window at the end and another at the side. The floor is laid with encaustic tiles from the entrance to the telling-table, beyond which it is formed of oak in narrow width. At the entrance end stand four Corinthian columns and pilasters of polished red granite, with bronzed capitals supporting a wall, which, higher up, forms part of the outside wall of one of the dwelling-houses. All the fittings, including the desks, &c., behind telling-table, are of mahogany. The principal cornice, which is carried round the room, is supported by projecting cantilevers, enriched by festoons, the spaces between being filled in with panels. Above this cornice springs the cove of the ceiling, rising to the central portion, which is flat and oblong in form, and divided into panels by stiles, in the centre of which runs a leaf enrichment, having at each intersection a boldly-modelled pendant.

The panels in the cove all round have been designed for the admission of light, and are filled in with glass of a pattern corresponding with the ornament of the other panels. The buildings were designed by the late Mr. David Bryce, but he having died before this portion was considered, the detailing of this, as well as the general internal finishing, fell to be accomplished by the junior member of the firm, Mr. John Bryce, under whose supervision the works have been completed.

On the basement floor are a large plate-safe and a spacious library, provided with a hoist, communicating with the telling-room; safes for bank-note paper, and cellarage, and also dwelling-houses for the porters and messengers employed by the bank.

The contractors for the work are:—Mason's, carpenter's, and joiner's work, Messrs. William Beattie & Sons; plumber's work, Mr. R. P. Beattie; plasterer's work, Messrs. W. Campbell & Son. Messrs. John Taylor & Son, Princes-street, supplied the cabinet and upholstery furnishings.

The City of London and Open Spaces.—By the new Act on open spaces the Corporation of London may acquire by purchase, gift, or otherwise, the freehold or interest in common lands not within the district of the Metropolis Management Act, but within twenty-five miles of the City, and may, among other matters, appropriate ground for cricket and other sports, and also for volunteers, having due regard to the enjoyment of the lands as open spaces for the recreation of the public and the rights of common.



THE HOSPITAL DRAIN DISINFECTOR.

THE HOSPITAL DRAIN DISINFECTOR.

THE ingenious arrangement illustrated by the accompanying diagram has been invented and registered by Mr. William Soper, M.R.C.S.E., and almost explains itself. The fundamental principle is the slow and constant evolution of chlorine gas in immediate contact with the sewage of infectious and other hospitals.

The question of sewerage disinfection has long occupied the attention of the leading chemists of the day, and the numerous experiments that have been carried out all point to the fact that, with the increasing growth of towns, so much more potent agents must be called into play to modify, at least, the injurious effects of sewage-gas. It has been asserted by a competent authority that "there is no known chemical process that effectually purifies sewage." It is claimed for this apparatus, that if it does not absolutely destroy every particle of gaseous and solid excreta, yet it minimises to the utmost the poisonous qualities of hospital excreta, and prevents the return currents of gas in its vitiated condition. It is recognised that typhoid, diphtheria, dysentery, cholera, and diarrhœa can in many instances be directly traced to sewage contamination. It is well recognised that chlorine is second to none in its potency in regard to disinfection and deodorisation. Now, carbolic acid, unless concentrated, acts merely as a preservative, temporarily arresting decomposition. Chlorinated lime and charcoal are soon exhausted, and cause obstructions. Condy's fluid is very costly. But chlorine gas as evolved from the apparatus can never obstruct the drains, is not expensive, and is universally disseminated through the mass of the liquid, and has the superlative advantage that it acts not only upon the liquid itself, but upon the gases in the upper level of the drain-pipe, while its solubility is so considerable that the whole of it is economised, and as the fluid passes onwards, so it carries it away in solution. The reservoir is charged with a mixture of common salt, binoxide of manganese, and diluted sulphuric acid, and this pours out the gas for three or four days. The conical form of the apparatus has much to do with its slow evolution, as a fresh surface is exposed and dissolved hour by hour. The indiarubber ring is to allow the generator to fit tightly upon its bed, and so prevent the escape of sewer gas up the shaft. The generator may be suspended at the base of a ventilating-shaft, as was done at Deptford. The sewer gas was most offensive at the top, but after the generator was introduced no smell was apparent, but only a faint chlorine odour, as was readily confirmed by the oxide of potassium and starch paper test. A modification of the apparatus has been designed for the disinfection of ambulances, dissecting-rooms, mortuaries, &c., and this has the special advantage that it may be wholly immersed in a putrescent fluid, and will render its solid and gaseous elements perfectly inodorous and innocuous.

Messrs. James Stiff & Sons, of Lambeth, are the sole manufacturers.

In a report of Dr. Buchanan, and an inquiry into the death-rate from all causes, and the death-rate from some particular diseases in twenty-five towns before and after sanitary improvements, the works have resulted in a lowering of the rate in nineteen out of twenty-five towns; the average reduction in these nineteen cases being 10·5 per cent., and the reduction in typhoid in twenty-one out of twenty-four being 45·4 per cent. This serves to remind us how important it is that improved sanitary arrangements of every kind should receive the fullest consideration, and be forthwith adopted if found efficacious.

IMPROVEMENTS IN COAL MINES.

A LARGE and influential number of mining and other engineers met together on the 3rd inst. at the Earl of Dudley's No. 30 coal-pit at Cradley, near Birmingham, to witness some experiments with Mr. F. Leonardt's patent safety cage and locking collar, the latter of which is designed to detach the cage from the rope in the event of overwinding; and the former is so constructed that, in that event, or the breakage of the rope, the cage becomes fastened to the guides by its own weight, and is so held until the cage is relifted by the rope. The locking collar is constructed of two wedges, one of which is attached to the rope by its thin end, and the other attached to the chains supporting the cage. When these wedges are placed together in position, they form a parallelogram over which a stout collar is driven just so lightly that any extra force brought to bear upon it will cause it to slide off. A small hole is drilled through both collar and wedges, into which a pin of any soft metal,—say copper,—is driven. In the event of overwinding, the collar is caught by the cross-beam at the top of the staging, and is forced off, thereby detaching the cage, which would, of course, fall to the bottom of the pit but for the safety appliances attached. These consist of two nearly circular cams, designed when in action to press tightly upon the steel guide-ropes. These cams are geared eccentrically, and are operated upon by two strong helical springs, acting on forked rods attached,

the other end of the rods being attached to chains which pass over pulleys, and are connected with the lifting-rope. The effect of this arrangement is that when the cage is going up or down steadily, the springs of the apparatus are compressed and the cams withdrawn, but on any sudden release the springs at once cause the cams to take effect, and the descent of the cage is prevented.

The general feeling expressed by the company was one of great satisfaction that at last we were placed in possession of means whereby winding accidents might be reduced to a minimum, both in mines and in ordinary lifts, and the inventor was warmly congratulated on its success. A vote of thanks was accorded to the Duke's agent, Mr. E. Fisher Smith, for his kindness in allowing the inventor a two months' trial of his apparatus, and for permitting the assembly to witness the experiments that day.

THE HIGH LEVEL BRIDGE OVER THE THAMES.

SIR,—This matter is of such great importance to the metropolis that I hope you will not cease to draw attention to the mistaken policy of the Metropolitan Board of Works. As I have taken occasion to point out elsewhere, the resistance to haulage which steep gradients present is not sufficiently appreciated, although, doubtless, carters and others similarly occupied can make shrewd guesses about it. Sir J. Bazalgette does not give us any information on this point, except to instance other bridges where there are steeper gradients than those he now proposes. But the fact that horses are heavily taxed in going up one hill, does not justify the construction of a hill elsewhere, which might be avoided; and it may be well to state in figures which all can understand what is involved in the climb of 35 ft. up to the summit of the high-level bridge. About 30,000 vehicles pass over London Bridge every twenty-four hours, and as the bridge nearest the sea always becomes the most important, it may well be assumed that a new bridge would take at least half the traffic. Moreover half the trading or manufacturing population of London is east of London Bridge. But assuming only one-third, or 10,000 vehicles to pass over per day, and also that an average weight for each vehicle with its horses is 2 tons, then 20,000 tons have to be lifted 35 ft. per day; or, to state it in convenient units, the work to be done equals 700,000 foot-tons. Doubtless horses have a reserve of strength which will enable them, in the case of cabs and other light vehicles, to surmount the hills without too much distress by reducing speed; but, as those who own and feed them know, the strain upon them is so much taken from their total daily capacity. But the Tower Bridge will receive a larger proportion than any other in London, of slow-moving heavy wagons, and with these the horses would not have such a reserve of strength. To draw 1 ton on a level granite-paved road, a force of from 30 lb. to 40 lb., according to the smoothness of the surface, is required; on a gradient of 1 in 40 an additional force of 56 lb. is needed to overcome gravity; and a carter can realise what effect upon his horses this more than doubling of the work will have,—the weight of the horse having also to be lifted.

Owing to the lower level on the Surrey side, the ascent to the bridge is there the most severe, and the spiral road proposed, with a continuous gradient of 1 in 40, is utterly unsuited for such an important line of traffic; and as horses cannot pull their best when climbing on a curve, the haulage force would have to be increased even in a greater proportion than that above mentioned. Unless, therefore, the police regulations are very stringent, it is probable that much of the heavy traffic,—which is just that for which a new crossing-place in the east of London is needed,—will still continue to pass from Surrey to Middlesex by London Bridge. A steep ascent from the Surrey shore can only be avoided by making much longer approaches,—a matter deserving attention; but accepting the starting-points now proposed, it is obviously desirable to avoid the unnecessary extra climb to the summit of a high-level bridge. On the Middlesex side the approach to a low-level bridge could be made nearly horizontal. If the east of London were generally hilly, and roads were apportioned to horses accordingly, one more short climb in the journey would not so much matter; but with level roads north and south of the bridge, a great waste of power will be incurred if the loads have to be kept down because of the long inclines of the high-level bridge; while if this ruling gradient be ignored, horses drawing wagons with the accustomed loads will be greatly distressed.

To shut out sea-going vessels from the wharfs between the Tower and London Bridge will doubtless cause loss to those interested in certain trades. On the legal question whether the wharfingers are entitled to compensation, it is not necessary here to enter; but the estimate of loss has probably been exaggerated. The river frontage above London Bridge commands high rentals, and in the difference between these and those now obtained below London Bridge, will the basis for computing compensation be found. The tendency of the shipping trade is, as in most river ports, to pass lower down the river. The construction of the new Victoria Dock below Woolwich will increase this tendency. Even now no vessels of importance come above the Tower. The wharfs whose trade is affected are ill-adapted for loading and discharging vessels. Most of the trade is even now carried on by lighters, and probably the wharfingers who require compensation will discover immediately after they shall have received it that they can still carry on their trade. At any rate, an estimate of the amount needed for compensation can be made, and a million more or less for so great an improvement as a new bridge would not be of supreme importance, while the permanent loss from the want of a low-level bridge, or from the wasted energy in crossing a high-level bridge, cannot be assessed.

In any case, invite the talent of Europe and America to send in competitive designs for the best solution of the problem, based on such preliminary instructions as Parliament may decide. The competition either to be open to every one, with rewards worthy of the importance of the case and of London, or let a certain number of the leading bridge engineers of the world be invited, with a handsome payment to each, as was done in the Law Courts competition.

EWING MATHESON, M. Inst. C.E.

THREATENED DEMOLITION OF THE CARLIOL TOWER, NEWCASTLE-ON-TYNE.

SIR,—One after another the old gates and towers of this town have been swept away for trivial reasons, together with the adjacent walls, until now little remains of what was formerly the chief glory of the town. The Town Council recently determined upon the erection of a free library, and upon a portion of the site chosen stands the Carliol tower, the most interesting of the old towers remaining. There is ample room for both the free library and the tower. Mr. Oliver, an ex-town councillor and an architect of repute, who originally suggested the site, prepared plans at his own expense, to show how the necessary building could be arranged without interfering with the tower; but, for the sole apparent reason of obtaining a straight line of frontage, the borough engineer proposes to demolish this most interesting feature!

As in former cases, I trust you will lend your powerful aid against the perpetration of this fresh act of vandalism.

NOVOCASTRIAN.

"THE VENTILATION QUESTION."

SIR,—Messrs. Ewart & Son suggest, at p. 973, that the proper way to try a ventilator is inside the four walls of a shop, by turning the revolver rapidly with the hand in the case of the Archimedian screw ventilator, or "vigorous fanning" in the case of fixed ventilators. Now, I beg to state that such experiments are altogether delusive, for this reason, that under the above circumstances there is no counteracting force for the ventilator to fight against, while the revolver of the Archimedian may be turned by the hand ten times quicker than the wind will generally turn it. I have seen a good up-current in a ventilating-shaft surmounted by an Archimedian ventilator when the said ventilator was standing still; also down-draughts when it was moving, especially, of course, when the movement was not very quick.

What is really necessary in the present state of the question is to have a new and different series of tests from those at Kew, viz., to place the cowls and ventilators and the open pipes upon a building with a fire or fires on in it, and admit only a certain amount of air, and have regulators to do so; then bring the amount of fresh air coming in down to that amount, which will nearly cause the plain pipes to blow down. This being done, or something similar, then try the plain pipes and the ventilators, and let us know the results.

In the building at Kew there was nothing to cause a down-draught or suck-down of air in any of the pipes; hence the said building cannot be taken as a pattern for houses or halls with fires on in them, and for this reason I cannot go entirely with the judges at Kew in their verdict, although agreeing with them to a considerable extent.

In the trial of ventilators I suggest, as many ventilators should be tried against the plain pipe as are sent in, a fee of from one to five guineas,—Mr. Banner suggests 100 guineas, but then it is only himself that might care to put in an appearance at that rate,—being taken to pay expenses.

W. P. BUCHAN.

CONCRETE HOUSES.

ANOTHER VIEW.

I KNOW Sutherlandshire well, and I feel convinced that concrete walls will not keep out the wet, and, if built, the exterior will have to be tiled or slated over, and the inside of all external walls would require battening out, leaving a clear air-space well and sufficiently ventilated to prevent the damp coming through. I know a shooting-lodge built at a large expense, under the direction of an experienced Scottish architect, of the best bricks, which has cost considerable sums to make habitable consequent on the water forcing through the external walls. The Duke of Sutherland's factors can give his Grace information as to the rainfall and the difficulties of building an external wall that can resist the humidity of the climate.

J. S. S.

THE FINISHING OF FURNITURE.

SIR,—Excellently as many firms turn out their furniture, one cannot help noticing what appears to be a decided defect in their upholstering, viz., the use of common white or black tin tacks. These always reveal their presence, and are very unsightly. I would, in certain cases, suggest the use of brass tacks instead, the colour of which would accord with the fashionable yellow bordering, and render their presence almost, if not quite, invisible. And in cases where brass would be as objectionable as black and white, why not adopt some means of overcoming the difficulty? If they must be visible, why not endeavour to render their presence as little conspicuous and objectionable as possible?

There is another suggestion I would make with respect to the finishing of furniture generally. The shape of rooms will not always permit persons to arrange furniture as they would, and thus the wash-stand or toilet-table has frequently to be placed before a window, and the consequence is the rough finish and bare wood are disagreeably exposed to the gaze of the public. Why not treat the backs as the fronts, and make these articles available for any position? At present, the only satisfactory way of treating these blemishes, is to arrange antimacassars tastefully over the backs, and so conceal them from public view.

The truth is, it is too often the manufacturer's aim to make articles look well, and throw all the attractiveness and finish into the portions generally exposed, and the other parts are rough in execution, slovenly in finish, as compared with joiner's work. If persons have the means, it is better to procure furniture made by joiners, although more costly. It is better finished, and will last much longer than that made by cabinet-makers.

T. B.

TRAMWAY SLEEPERS.

SIR,—Have you observed the sleepers used in the tramways which are being taken up and relaid in the metropolis? They appear simply yellow deal, without any preparation against decay. If we omit all consideration for the shareholders, the public surely should be able to require such a mode of construction as will be most efficient against decay, when the relaying is so great a public inconvenience. If I remember rightly, a correspondent called your attention to the use of timber similarly unprepared when some of the tramways were originally laid.

F.

SKETCHING IN OUR CATHEDRALS.

SIR,—A few days ago I visited the neighbourhood of Worcester, and in the afternoon I entered the cathedral, which was being prepared for the Triennial Music Festival. In the course of my looking round, I saw a large hall known as the Grammar School; finding the door open, I had no hesitation in entering, and was gratified at seeing a fine old hall of early date; it was fitted up with temporary galleries for musicians and visitors. At the east end, in the centre of the wall, a very beautiful carved altar enrichment has recently been uncovered. It is of Early English date, with a mutilated figure life-size in the centre, with the head gone. Immediately over this is a small square-headed five-light window of Flamboyant tracery: such a window in England is of rare occurrence. As no one was in charge of the place, I immediately began to sketch it. The tracery has been mutilated in the upper part, and the glazing has been removed, and the lights blocked up. As soon as I saw it, I remembered having seen in Mr. Rickman's "Gothic Architecture," published in 1848, at p. 153, an illustration of a window very similar to this as being at Bolton Abbey, Yorkshire, yet when I was there it was not to be seen, nor did the aged clerk remember ever having heard of it or seen it, and I then in my own mind judged that Mr. Rickman had made a mistake in the name of the place, especially as I did not see it in his subsequent editions. However, while I was sketching, a workman came up and asked me if I had leave to sketch. I said "Yes." He asked from whom? and I replied, "Mr. Hughes." He said he did not know of the name as having any right to give me leave to sketch, that I ought to have asked Mr. Simpson the deacon. He left me for a few minutes, and then returned, saying I must go to Mr. Simpson, which I did in the cathedral, and when confronted with him the informant said, "This is the man that I found sketching in the Grammar School." I said I had asked Mr. Hughes in the nave. The deacon said it was wrong of him to give leave, and that as the place was being prepared for the music festival, he could not allow me to sketch. I said no one was in the way, nor had I obstructed any one, as there was not a single workman at that end of the building, and he briefly said I must come another time. I said I lived at a distance, and it would take but a few minutes to complete what I had begun. He would not hear of it, so I made my exit. In our various cathedrals there is a remarkable difference in the treatment of strangers who may go to the extent of sketching in the portions open to the public. At most of them a visitor will receive no check in his desire to sketch any portion of the building, while at others the dignity of a deacon is very much upset by a stranger attempting to sketch in a cathedral without his permission, although he may be inaccessible at the moment, as was the case with myself. During the last twenty years our minor cathedral officials have given up their objection to sketching visitors, and I trust that before long this may be the case at Worcester Cathedral.

J. B. WATTS.

THE HEALTH OF TENBY.

SIR,—Douglas A. Reid, M.D., in replying to my letter on the sanitary state of Tenby, has adopted a most extraordinary method of doing so. It has been said that when a lawyer has a bad case all he can do is to abuse the opposite counsel; but that is considered rather a low trick. Mr. Reid has descended to a still lower trick, for he has fallen foul of my wife's relations for the purpose of withdrawing attention from plain facts with which they had no concern. . . . . What Mr. Reid states with respect to my relations may be true or false for anything I know; all I can say on that matter is that I never knew or heard anything of what he states concerning them until I read his letter in the *Builder*. How, then, could any "animosity be inspired" by what he states concerning them?

The facts communicated by the Registrar-General's reports cannot be annulled by low personalities. Mr. Reid has attempted to show that the mortality of Tenby is not so excessive as the Registrar-General puts it by a process of weeding. He first weeds out certain outlying districts, and then deducts the deaths of certain visitors; by doing so he reduces the death-rate to 14·6 per 1,000, which is still excessive when compared with other towns under similar circumstances. If Mr. Reid is to be allowed to make deductions for outlying districts and the deaths of visitors from the mortality of Tenby, we must make similar deductions from the other towns with which I compared Tenby; by doing so we shall find the death-rate of Tenby still more than double that of other sea-side watering-places which I named in my former letter. Even without making such deductions, Herne Bay stands at 8·5; Lowestoft, 12·5; Worthing, 12·3; and these places have a greater proportion of visitors than Tenby. So that when we compare Tenby with other watering-places Mr. Reid gains nothing by his weeding process, for it shows that a high rate of mortality does exist in Tenby when compared with the towns I have named.

Now with respect to the water supply, I adhere to everything I stated regarding it in my former letter. I have witnessed the droppings of cattle washed into the old reservoirs; I have caught dozens of tritons with my own hands in the reservoir; I have seen the road-dust blown into the new reservoir. Mr. Reid says, "Filter-beds of gravel, charcoal, and sand have been constructed," but he is very careful not to say that the whole of the water supplied to Tenby is filtered through these filter-beds, although he would lead us to infer that the water is all filtered. The fact is, a very small portion of the water is filtered.

As to the drainage, I still assert that it is very imperfect, and the drains are very badly ventilated. The smell from the outfall sewers has been often complained of both by residents and visitors, and the smell has even been complained of at public meetings. Mr. Reid says, "There are no ash-pits, all the house refuse being carted away daily." Does Mr. Reid mean that to be a complete answer to my assertion that there are many *foul cesspools* in Tenby? I will now add that there are many open privies, which ought not to be allowed to exist in a place like Tenby. If the Corporation of Tenby had done their duty, these cesspools and privies would have been abolished years ago. No town can be said to have a "perfect system of drainage" where privies and cesspools exist.

Mr. Reid refers to an action I brought to recover a just claim, which could have no connexion with the sanitary condition of Tenby. He says, "The arbitrator's award has been for some time past ready for Mr. Burns to take up." That is true; and it has also been ready for the Tenby Corporation to take up; "for some reason or other they hesitate to take it up."

I brought the action for payment for certain surveys, plans, and specifications, ordered by the Tenby Town Council, which were approved of by the Corporation, and also by a committee appointed to examine them. The Town Council offered to refer the case to arbitration if I would accept the arbitrator appointed by them. That I agreed to do. The Town Council also suggested that in order to keep down expense, neither party should employ counsel in the case, but only to engage a solicitor each, which I also agreed to. It was also agreed that my claim should be tried on its merits alone; but, to my surprise, when my case came on, the Tenby Corporation appeared by counsel and two solicitors against my one solicitor, and even then they found they were being beaten on every point in equity, when the counsel turned round and put in the technical objection that there was no contract *under the seal of the Board*. The arbitrator took counsel's opinion, and made a *preliminary award* on that technical point only. I decline to pay the arbitrator's charge, 170*l*., to take up his award on a technical point, but I must say I consider it was a dirty trick, as well as a dirty plea, on the part of the Tenby Town Council, for they have deprived the arbitrator of his fees, as well as me of my just claim. I decline to take any further notice of a writer who can so far forget his position as to drag in personalities for the purpose of hiding a plain statement of a fact that *the death-rate of Tenby is greatly in excess of many other watering-places in England*.

WM. BURNS.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

SIR,—I quite agree with the very sensible suggestion which was made in the *Builder* of Sept. 7 by Mr. T. Blashill, under the above heading. I have no doubt he sees the difficulties which would attend a complete—a satisfactory inquiry, and has not thought it necessary to state more fully the conditions. I venture to think that if his suggestion can be properly carried out it will prove of greater value to the public than horse-shows, dog-shows, fan-shows, and the like. It will also doubtless prove of great pecuniary advantage to the makers of such ventilators as shall be found to be the best for all the practical purposes of proper ventilation. The conditions will require of course to be carefully settled with that object solely in view, and gentlemen who have already acted as judges in late cowl-tests would probably consider themselves ineligible as judges in the suggested inquiry, which I would submit had best be undertaken by the Society of Arts, the Institute of Civil Engineers, or the Institute of Architects, or a committee formed of members of all three.

Playing at cowl-testing would have no useful result. Ventilation is perhaps as little understood as any science. It is a very important branch, and there can be no doubt the committee would be undertaking a most difficult and arduous task, and one, in fact, which would scarcely be worth while, unless the tests extended over a period long enough to include all winds and all weathers, ever-varying velocities of winds, different states of the atmosphere within and without, permanence of "pull" when there is not a natural up-current, and freedom from down-draught when there is a natural down-current, exclusion of water in wet weather and through condensation,—serious failings in plain open or trumpet-mouthed pipes, even if they be capped or be made lobster-backed, and which alone may upon consideration be thought sufficient to exclude them from the comparative tests; besides which they freely,—often too freely,—admit cold air down them, although at other times they allow of the *escape* of vitiated air up them. Considering the various and great changes which so often and so suddenly occur in some of the most important conditions, it may be considered necessary to test the various ventilators more continuously *at the same time* against each other, and in such case two tubes will perhaps not be enough. I feel certain such an inquiry cannot be carried on without considerable expense, towards which exhibitors should mainly contribute.

Exhibitors of ventilators, cowls, and pipes should be divided into at least two classes; those who do not intend to enter any of their exhibits as competitors for supremacy, and those who do. The judges or committee should have power to exclude from the contest any ventilator, cowl, or pipe which they may deem ineligible from whatever cause. Each competitor for supremacy should pay an entrance-fee (in proof of his own good opinion) of, say, 100 guineas, and those who intend to exhibit only should pay a fee of, say, ten guineas. The fund, after payment of expenses incurred, to be applied as the committee may direct.

I shall be glad to pay 100 guineas for the privilege as mentioned, and no doubt others who have equal confidence in their ventilators will be glad to do so also.

E. GREGSON BANNER.

ECCENTRIC.

THE contents of Dulford House, near Collumpton, Devonshire, have been sold by auction during the past week, the sale lasting six days. Messrs. Frost & Collings, of Teignmouth, were the auctioneers. The late owner was Mr. Bethell Walrond. His will was disputed on account of alleged insanity, and this sale is the result of proceedings in the Probate Court.

Dulford House is an intensely ugly mansion, built a hundred years since by the late Lord Monteith. It and its thirty acres of ground are inclosed by a brick wall 12 ft. high, and upwards of one mile in circumference. Mr. Walrond's eccentricities were manifold, and well known. He kept for a number of years the embalmed body of his daughter in his dressing-room, nor was she buried till after his death. He slept upon a massively-carved old oak bedstead, and upon the footboard he had the skulls of five females facing inwards; whilst above, at the four corners overhead, were waving hearse-plumes. He believed in the transmigration of human souls into animals, and had a cemetery upon his grounds wherein the dogs were buried, and over whom headstones, giving the name, date of birth, &c., are erected. His collection of carved oak furniture, nearly all of a pronounced Devonshire type, was very extensive. Over a hundred carved oak chests were knocked down by the hammer. Some of these were very handsome, and all fetched high prices. One bedstead went for 50 guineas, and an unfinished one, bearing the date A.D. 1601, made 40*l*. Two small cases of seals, after a spirited competition with the British Museum's representative, were bought by Colonel Ridgeway for 100 guineas. A bust of Napoleon by Canova was sold for 75*l*. to Mr. Doddington, of Horsington House; and a large figure in Spanish chestnut of the "Madonna and Child" were bought for 18 guineas by Mr. Harry Hems, who was also a large purchaser of carved oak-work. The pictures had all been sold previously. A fine collection of armour, which originally cost the owner more than 1,000*l*., was also sold. It had suffered much from neglect, and its value therefore was much deteriorated. Four lay figures, clothed in ancient armour, went for twenty, sixteen, fifteen, and twelve guineas, the best going to Mr. Brand. Mr. Walrond owned quite an armament of artillery, and fifty cannons, from eighteen-pounders downwards, were offered for sale. The eighteen-pounders went for three guineas and less a couple, but four pairs of bell-metal guns, weighing about 100 lb. each, fetched twenty guineas per pair. The sale attracted a large assembly.

CHURCH-BUILDING NEWS.

Beer.—The new Church of St. Michael, Beer, near Seaton, Devon (which has been built at the sole cost of the Hon. Mark Rolle), has been consecrated. It consists of a nave, with north and south aisles, chancel, north and south transepts, clergy and choir vestries, and a tower on the north side of the west end, with a square spire, rising to the height of 112 ft. The material used is the blue stone found in the neighbourhood, with Beer stone dressings. The spire is entirely of Beer stone. The style throughout is Early English. The nave is 72 ft. long by 21 ft. wide, and is covered with an open roof of pitch pine, the height to the ridge being 46 ft. The north and south aisles are divided from the nave by four arches supported on columns of Devonshire marble with carved capitals. The church will hold about 700 persons. A pulpit of Beer stone is erected on the north side of the chancel arch. The front is panelled and enriched with marble columns. On the south side of the chancel arch is an oak lectern, presented by the Hon. Miss Trefusis, a sister of Mr. Rolle, who did the carving herself. The work has been carried out from plans prepared by Messrs. Hayward & Son, architects, Exeter, by Messrs. Stephens and Bastow, builders, Bristol. The marble work has been supplied by Mr. Blackler, of St. Mary Church. Mr. Harris has acted as clerk, and Mr. Charles Hampton as foreman, of the works. The carving has been executed by Mr. Harry Hems.

Minnishant (*near Ayr*).—A new church, erected at Minnishant, about five miles from Ayr, by Sir Peter Coats, was opened on the 25th of August. The church is intended as a memorial of the late Lady Coats. Messrs. Turnbull & Thomson, of Glasgow, are the architects.

Great Sutton.—The foundation-stone of the new Church of St. John, Great Sutton, near Eastham, on the Chester and Birkenhead-road, was laid on the 28th of August, by Mr. John Torr, M.P. The designs show an edifice in the style of the latter part of the thirteenth century, consisting on plan of a nave, large chancel, organ-chamber, vestry, south porch, and attached tower and spirelet. Sitting accommodation is provided for 256 worshippers, whom, for the present, it is intended to seat on chairs. The whole of the roof will be open-timbered to the ridge, divided by moulded principals, and plastered between the rafters, the chancel roof being boarded in panels and divided with ribs. The internal decorative and dressed features are to be of Stourton white stone, and the remaining walls plastered upon an internal lining of brick. The external facing of the walls is of shoddies from the Wrexham quarries, of a warm brown tint, with dressings of white Stourton stone, and silver-grey slate for the roofing. The tower, rising square on plan, and breaking into an octagonal form some height above the nave walls, is continued circular on plan, and terminates in a stone spire with ornamental cross, the whole rising to a height of about 70 ft. The present

contract, amounting to about 2,000*l.*, embraces the tower and spire to the plinth line only, and is being executed by Messrs. Tomlinson & Sons, of Leeds and Chester; the architect being Mr. David Walker, Liverpool.

Doune.—St. Modoc's Episcopal Church, Doune, N.B., was consecrated on the 29th of August. The plan (which was prepared by Mr. Brooks, architect, London) shows a chancel, nave, north transept, north aisle, vestry, tower, and spire, the lower portion of which serves as porch. These have all been erected save the north aisle and tower. The style chosen is that of the early part of the thirteenth century. The church is built externally of Polmaise freestone, with "random rubble," droved with rustic face; and internally, with Dairsie freestone, with rustic face. The chancel is groined throughout. The nave has a wagon-roof, boarded on the underside with red and white pine, and divided into compartments so as to admit at some future time of painted subjects. The contractors were—for mason work, Mr. Jones; and for joiner work, Mr. M'Niven, Doune.

SCHOOL BOARD SCHOOLS.

Fenton.—New Board Schools have recently been opened at Fenton, Staffordshire, by the Stoke School Board. The building has a frontage to the street of about 90 ft., and is of two stories. The boys' school is on the first floor, and consists of a main room 70 ft. long and 22 ft. wide, with two large class-rooms, the accommodation being for 320 scholars. The girls' school is also on the first floor. There are in this department a main room and two class-rooms for 240 children. The school for infants consists of main room to accommodate 120, and two class-rooms large enough for 95 children each. The cost, inclusive of the site, was 6,440*l.*, giving an expenditure of 6*l.* 10s. a head on the accommodation provided.

Oystermouth.—New Board Schools for 450 children have been opened at Oystermouth, near Swansea. Mr. Thomas is the architect. The schools give 185 cubic feet of space for each child, with an area of 8 superficial feet. Mr. Billings was the contractor.

Greenwich.—New school buildings in Randall-place, Greenwich, have lately been opened by the School Board for London. The site secured is sufficiently large to allow of ample space for a playground. Accommodation is provided for 763 children, at a cost of 1,200*l.* for the site and 9,145*l.* for the building, exclusive of incidental expenses. Mr. E. R. Robson is the architect.

Sherwood.—On the 6th ult. new Board Schools at Sherwood were opened, under the auspices of the Nottingham School Board. The schools have been built from plans by Mr. Herbert Walker, the builder being Mr. Stainforth, the desks and inside fittings being supplied by Messrs. Colman & Glendenning, of Norwich. Accommodation is provided for 150 children, at a cost of 2,400*l.*

Books Received.

House Drainage and Water Service in Cities, Villages, and Rural Neighbourhoods. By JAMES C. BAYLES. David Williams, New York. 1878.

THIS is an American contribution to the sanitary question, arising, as the writer tells us, from the extensive correspondence on the subject which, as editor of *The Metal Worker*, he had long carried on with persons practically interested in the mechanics of hygiene. The work, however, is concerned not so much with sanitary engineering, as with that part of the operations in which the householder and plumber are mainly interested, after the engineer has done his part of the work. So, at least, the author limits the object of his treatise, though a chapter headed "Water Supply in Country Districts" seems to belong rather to the engineer. We ought to have something to learn from an American book on the subject, if it be true, as Mr. Bayles tells us (and we are inclined to think that it is true), that the Americans, on the whole, "live in more comfortable houses than are to be found in any other part of the world." On the subject of sewer gas, to which his first chapter is devoted, the author confirms the view which some theorists have already started in England, that it is not the noxious-smelling part of the sewer emanation that does the mischief; and he reasons out the matter logically, pointing out that sulphuretted hydrogen, the most strongly-smelling of the elements of sewer gas, is often diffused in a chemical laboratory in stronger proportions than it ever comes out of sewer openings, and yet that chemists are not worse in health than other people. He explains the evil effects of sewer gas by the presence of organic germs,—organic vapour, as he calls it, which sows the seeds of disease, and is at present undetected by chemical analysis. This, of course, is another application of Professor Tyndal's now well-known theory. Looking at the matter in this way, the author is, no doubt, right in assuming that the sense of smell affords a very uncertain criterion as to whether a house is or is not healthy and properly drained. Nevertheless, we hold to our old opinion that a bad smell is a warning of danger.

It would be interesting to find any fresh light or experience from American practice in regard to the removal of excreta and the provision for adequate trapping in connexion with water-closets, or any of the other arrangements that have been proposed in substitution for them; but here we find the author pretty much where we are ourselves. He recommends iron for soil-pipes in place of lead, but chiefly for economical reasons, holding that lead soil-pipes should be thicker than they are usually made, but that in that case they become heavier and more costly than an equally efficient iron pipe. He admits, however, that he has seen much harm arise from unsatisfactory jointing of iron pipes,—a matter which it is very difficult for an architect, or even a contractor's foreman, always to see to, and which we should be sorry to leave to the care and conscience of the average workman. In regard to closet-traps, we find the now nearly universal opinion as to the untrustworthy character of the ordinary water-seal repeated. He gives (p. 81) a section of a trap which he recommends as more impervious than the most usual forms of S-trap, and not liable to be drawn by syphoning, and it would probably have these qualities, but it also appears to be a form very liable to detain fœcal matter unless served with an unusually strong flush of water. On the whole, however, our American coadjutor is in favour of the water-closet against any other system yet advanced; strongly recommending, however, simplicity of construction and action as one of the most important qualifications of a closet-apparatus. The proposal for the adoption in houses of the "ship's-closet" apparatus, where the removal of the contents of the pan and its subsequent flushing are effected under pressure by the up-and-down stroke of a piston, may be worth consideration: the apparatus has the advantage of acting very directly and forcibly both in emptying and flushing. The author draws attention repeatedly to a source of nuisance in closet-traps which is not thought of or contended against so much as it ought to be, that, namely, which arises from the detention and accumulation of matter on the sides or in the bottom of the trap. Even if the water-seal be sufficient to check (under proper ventilation) all in-draught from the drains, there can hardly be purity of air in the closet when the trap itself, which is intended as the safeguard, is tainted with foul matter. This is just the radical difficulty of the S-trap system; if shallow, the water is hardly a sufficient seal; if deeper, there is additional difficulty in keeping the trap unfouled, and making the flush effective.

It appears from the chapter on Service Pipes that considerable experiment has been made in America in regard to finding a satisfactory substitute for lead for this purpose. The author thinks there is a great deal to be said for iron piping, the only real objection to it being the liability to internal rust to such an extent as to require too frequent replacement. In regard to sanitary conditions, it was found, in the only case in which the author was able to observe the results of an iron-pipe supply over some years, that not the slightest ill effect was caused upon the water. This was in the case of Swarthmore College, Delaware County. "Water was introduced into the college building through iron pipes in 1869, and from that time till March, 1875, at which date my inquiries were made, they had required and received no attention or repairs. In February, 1875, some changes were necessary, and a piece was cut out of one of the pipes which had been in constant use for six years. Its original diameter of bore, —1½ in.,—had been reduced to about 1 in. by the accumulation of rust on the interior surface. At my request, the respected president of the institution, Professor Magill, caused a series of analyses to be made to determine the chemical effects of the iron on the water. Samples were taken from the spring and drawn from the cocks inside the building, and the latter were found very pure, containing no trace of organic matter. The most remarkable fact was that the percentage of iron in the water taken from the cocks was only about two-fifths of that found in the water taken directly from the spring. This was established by repeated determinations, and the fact cannot be doubted that the passage of the water through iron pipes had caused it to deposit three-fifths of the iron it had previously held in solution." Still the rusting up of the pipe is of course a serious practical objection. Of the various methods that have been attempted to provide a satisfactorily lined iron pipe, the author recommends as the best that which is formed by placing a thin tin pipe of slightly smaller diameter within the bore of the iron pipe, and then expanding it under powerful hydraulic pressure till it clings to the interior of the iron pipe, adjusting itself to all irregularities in the latter, which, in fact, form a key for the tin lining. This the author recommends as "the best pipe for water conveyance ever made." It appears that glass-lined iron pipes have been tried in America. They are, as one might expect, troublesome in fixing, owing to the brittle character of the lining, and are likely also to give considerable trouble if allowed to freeze; though, on the other hand, "I am informed," says Mr. Williams, "that water in glass-lined pipes will bear exposure to a temperature 14° Fahr. below that which would freeze water in lead pipes": an important quality, certainly. Anything that would help to preserve us from the nearly annual epidemic of pipe-bursting in frosts would be a great boon.

We must pass over the long and full chapters on the hydraulics and the chemistry of plumbing; but those on drainage and water-supply to country houses are of interest to English readers as affording some information on the state of sanitation in country districts in the States. This seems to be very backward, and the author leads us to conclude that outdoor privies may be found in connexion with country residences of a good class (not, we presume, among the more recently erected) of such a type as in England would only be found in the cottage yards of a poor village, or on a very neglected estate. For country districts earth-closets have the author's recommendation, and in fact are in many localities the only possible alternative to the privy. It appears, however, that "the common method of draining country-houses of the better class in the United States is into stone or brick cesspools"; nor is the author prepared to advocate their abolition, but only to insist on their proper construction; namely, that they should be perfectly tight, that they should be so small as to necessitate their being emptied every few weeks (by means of a suitable pump fixed for the purpose), and that they should have efficient ventilation to relieve the drains from pressure of gas. An illustration is given (p. 277) of a form of ventilator that has been found to answer well, consisting of a kind of wooden cupboard, about the shape and general appearance of a sentry-box, but with closed sides and a louvre opening under the cover, placed over an opening in the stone cover of the cesspool: within this are successive shelves bearing charcoal, between and over which the gas from the cesspool passes in finding its way out.

The supply of water to isolated country-houses is often a matter of considerable difficulty, mechanically speaking. Our author, however, wishes his readers to lay stress on the importance, not only of having a convenient and economical method of supply, but of paying more attention to the nature of the source whence the supply is drawn. It would seem that, in country-houses in the States, this is not unfrequently quite neglected, as if any water that came out of the ground from natural sources must be healthy. "It is a well-established fact that, since the introduction of aqueduct water into large cities, typhoid and many other fevers,—resulting, among other causes, from water-poisoning,—have become more common in the country than in cities." An instance is mentioned in which a family "of refined tastes" were for years content to draw all the water they used for drinking and cooking from a spring choked with rank weeds and mosses, full of reptile life, and lying in the middle of a foul mud-bed, kept soft by the con-

stant tramping of horses and cattle which were allowed free access to it. They had never given the condition of the spring a minute's thought; and even when diphtheria broke out among the children in consequence, it was difficult to persuade them of the necessity for reform. In the great and only partially explored geological formations of America, it is probably much more difficult to know where good water may be reckoned on than it is with us. Many abundant natural water-supplies in newly-inhabited localities have proved utterly delusive as to the character of the water. The author remarks:—"I have seen and drunk very wholesome and satisfactory water,—notably, that drawn from the juniper swamps of Virginia,—which one not accustomed to it would hesitate to taste; and I have also seen water drawn from deep wells,—cool, clear, and sparkling,—which was the means of poisoning many people, some of them fatally, and which no one could drink with impunity." Concerning the mechanical means of lifting the water from the source of supply to the house, in the case of a country residence, little or nothing is said. In England we are rather "expecting" in that way, and divers patent contrivances, self-acting and otherwise, have been offered to the public. The author's chapter on "the plumber and his work," not ill-natured, though sarcastic, might be read with advantage by plumbers on both sides of the Atlantic.

Handbook for England and Wales, Alphabetically arranged for the Use of Travellers. With an Outline Map. London: John Murray. 1878.

HAVING filled a library with detailed handbooks for England and Wales, Mr. Murray has had them all boiled down or submitted to the hydraulic press, and now issues one little red volume, which contains the result. The editor, however, claims that he has visited nearly every county, and has verified or corrected, either by himself or others, the information given. The alphabetical arrangement has been wisely adopted, and we unhesitatingly commend it to tourists as the most compendious and accessible guide to England and Wales that can anywhere be found.

Miscellanea.

A Railway up Vesuvius.—This seems to be now seriously intended. Plans submitted by the banker, M. Oblieght, have been approved by the Department of Public Works, and the necessary "concession" has been made by the Prefecture of Naples. The carriages on this railway will be drawn, not by a locomotive engine, but by a wire rope. The line will be double. The rails will be laid on an iron framework supported by pillars, also of iron. The pillars will be a little over six yards and a half apart. According to the report upon the plans, it appears that the length of the railway up the mountain will be about 919 yards. The station near the summit will be 420 mètres (nearly 460 yards) higher than that at the foot of the mountain, which gives the very steep gradient of one in two. The traffic will be carried on by eight carriages, each having room for four persons; these will be so distributed that while four are engaged in making the ascent, the remaining four will be descending the mountain. The carriages will be kept 210 mètres (nearly 230 yards) apart from one another. To guard against accidents, each carriage will be fitted with two newly-patented automatic brakes, which, should the rope happen to break, will instantly stop the carriage. The whole machinery will be set in motion by two steam-engines of twelve-horse power each. How long will the wire rope last under such conditions? A wire cord with which we once suspended a bird-cage over a pulley, raised and lowered only two or three times a day, frayed and broke, and was useless in a singularly short time.

Kirkintilloch Gasworks.—The following award has been issued by the arbiters in the submission between the Police Commissioners and the Gas Company of Kirkintilloch:—The works are to be taken over as at the 15th of May last; the Company are to have right to all outstanding debts, and are to pay all outstanding liabilities as at that date; the price to be paid is 14,000*l.*, which includes the gas reserve fund, which amounts to about 1,300*l.*; and interest is to run at the rate of 5 per cent. from the 15th of May last.

The International Meeting of Printers, Paris.—The September number of the *Printing Times and Lithographer* contains an interesting report of the proceedings at the International Banquet given at the Grand Hotel. Our connexion of long-standing with the house of Wyman & Sons shall not prevent us from complimenting Mr. Charles W. H. Wyman on the part played by him on that occasion. He referred eloquently to the meeting as being the first friendly reunion, at an international banquet, of the printers of the Old World and the New. He believed that the future would exhibit a closer relationship between printers everywhere. In these times it was almost impossible to strike out a new idea, yet to Herr Goebel belonged the merit of having proposed, what France had so successfully carried out on the present occasion, the first international meeting of printers which had ever been held. He regarded it as a fact of great interest and significance in the annals of printing, and one which should make every one present conscious of assisting on a great historical occasion. The meeting showed by their applause how fully they agreed with him.

Cornish Antiquities.—An interesting discovery of antiquities is reported to have been made at St. Just, near Penzance, during the past few days. On the summit of some land which rises immediately from the edge of Berthnal Cliff, St. Just, Mr. W. C. Borlase, F.S.A., discovered a pile of surface stones, which appeared to him to be a cairn of the same description as others in the neighbourhood, but of unusually large size. On driving in a level from the north-east side a wall was soon reached, 11 ft. in height, built of solid dry masonry, and sloping inwards as it reached the top, in the manner of a beehive. This proved to be part of a circle, 30 ft. in diameter at the top, where the cone had been truncated, and not less than 40 ft. or 50 ft. in diameter at the base. On cutting through the outer wall, at a height of 5 ft. from the solid ground on which it was built, a second wall, similarly constructed, was discovered, placed concentrically with the outer wall, at a distance of 5 ft. 6 in. within it. The whole of this structure, when perfect, cannot have been less than 18 ft. or 20 ft. high, and by the quantity of *débris* found around it may have been entirely covered in by a pile of stones.

South Willingham Church, Wragby, Lincolnshire.—A turret-clock, showing time on four dials, has just been fitted in the tower of this church. Its manufacture was entrusted to Mr. J. W. Benson, of Ludgate-hill. The clock strikes the hours, and a blow at the half, upon the tenor bell, weighing 13 cwt. The whole of the wheels are of hard brass, the main wheel measuring 12 in. diameter, and ¼ in. thick. As usual with most clocks made by this firm, the escapement is a Graham's dead beat. The pendulum is 7 ft. long, and beats 1½ second, with a bob weighing 1¼ cwt. The entire weights for working this clock are about 3½ cwt.

The Platt Monument, Oldham.—On Saturday a monument to the late John Platt, M.P. for Oldham, was unveiled by his widow in front of the Town-hall. Mr. Platt was member for Oldham from 1865 to 1872, and head of the machine firm of Platt Brothers & Co. This firm, which at the time that Mr. Platt joined his father as partner employed only 400 hands, employed in 1872 between 7,000 and 8,000, and is still increasing, although the present commercial depression is producing slackness at the works. The monument, which consists of a statue in bronze, is the work of Mr. D. W. Stevenson, Edinburgh, and cost 3,000 guineas.

Giving Trouble.—The secretary of the Hampton Court Gas Company has informed some of the candidates for the office of Collector to the Company, salary 150*l.* per annum, that over 1,800 applications have been made, the "great majority of which, *primâ facie*, indicate adaptability for the post." It seems to us that to advertise for candidates for such a post as this, the qualifications for which are universally possessed, is little short of reprehensible, serving simply to give profitless trouble to a large number of persons.

Accident in a Church.—An accident happened in Bedminster Old Church, Bristol, which is undergoing cleaning and redecorating. While the contractor, Mr. Manning, and three workmen were engaged over the chancel arch the scaffolding gave way, and the four men fell about 40 ft. Mr. Manning, it is feared, has sustained concussion of the brain.

Elgin.—The operative masons in Elgin are at present on strike, in consequence of a resolution of the employers to reduce the wages a half-penny per hour. The men, it is stated, do not object so much to the reduction itself as to the breach of the agreement which has taken place. They say that three months' notice of any reduction should have been given; whereas one week's previous notice only on this occasion was made.

Chingford Railway Station.—On the 13th inst. the *employés* of Mr. T. D. Ridley, contractor for the new Chingford Railway Station, had a dinner at the "Bull and Crown," Chingford, in commemoration of the erection of the station, and extension of the line from the old temporary station.

Engineering.—Mr. J. H. Taylor, of Buxton, has been appointed resident engineer for the completion of the new reservoir for the Buxton Local Board, and he has also been appointed engineer for the intended reservoir to supply the district of the Local Board of Fairfield.

TENDERS

For the alterations and redecoration of No. 27, Sussex-place, Regent's Park, and rebuilding stables in the rear. Mr. F. W. Hunt, architect:—

Phillips & Son	£2,545 0 0
Simpson & Son	2,445 0 0
Bywaters	2,270 0 0
Philps & Bisiker	2,258 0 0
Blyth	2,247 5 0
Clark & Bracher	2,058 0 0

For alterations at the Brandon Arms, Brixton, for Mr. F. Garner. Mr. Edward Brown, architect:—

Miller	£463 0 0
Kiddle & Son	315 0 0
Marr (accepted)	3 9 0 0
Palmer	295 0 0

For alterations at the Sugar Loaf, Great Hermitage-street, Wapping, for Mr. N. Argent. Mr. Edward Brown, architect:—

Stamp & Bowtle	£459 0 0
Marr	438 0 0
Salt (accepted)	365 0 0

For the erection of a villa residence in Romford-road, West Ham, Essex, for Mr. G. Roberts. Mr. Edward Brown, architect. Quantities supplied:—

Outhwaite & Son	£1,955 0 0
Norton	1,9 0 0 0
Kiddle & Son	1,892 0 0
Marr (accepted)	1,881 0 0

For alterations at the Weavers' Arms, Pelham-street, Mile-end New Town, for Mr. F. Garner. Mr. Edward Brown, architect:—

Kiddle & Son	£835 0 0
Marr	697 0 0
Allard (accepted)	560 0 0

For villa residence, Romford-road, for Mr. George Roberts. Mr. Edward Brown, architect:—

Marr (accepted)	£1,881 0 0

For repairs to the Marylebone Stores, Paradise-street, High-street, Marylebone, for Messrs. Hanbury & Co. Mr. Edward Brown, architect:—

Salt	£238 0 0
Marr	192 0 0
Palmer	185 0 0

For alterations at the Marlborough Head, Pelham-street, for Mr. F. Garner. Mr. Edward Brown, architect:—

Marr	£465 0 0
Kiddle & Son (accepted)	375 0 0

For building seven shops and warehouses in Jewin-street and crescent, on site of Wesleyan chapel. Messrs. Ford & Hesketh, architects:—

Kirk & Randall	£11,640 0 0
Mark	11,604 0 0
Downs & Co.	10,637 0 0
Conder	10,370 0 0
Peto, Brothers	10,328 0 0
Browne & Robinson	10,292 0 0
Scrivener & Co.	10,261 0 0
Killby	10,219 0 0
Braid	10,148 0 0
Crabb	10,100 0 0
Ashby, Brothers	10,096 0 0

For rebuilding the Rainbow Tavern, Liverpool-road, Islington, for Messrs. Watney & Co. Mr. H. J. Newton, architect. Quantities supplied by Messrs. Lamb & Church:—

Grimwood & Sons	£3,970 0 0
Godden	3,897 0 0
Hockley	3,820 0 0
Dove, Brothers	3,775 0 0
Axford	3,625 0 0
Lamble (accepted)	3,420 0 0

For rebuilding the Artichoke public-house, Lower Marsh, Lambeth, for Messrs. Watney & Co. Mr. H. J. Newton, architect. Quantities supplied by Mr. H. W. Budd:—

Grimwood & Sons	£2,730 0 0
Godden	2,677 0 0
Lamble	2,627 0 0
Dove, Brothers	2,575 0 0
Hockley	2,390 0 0
Anley	2,187 0 0

For alterations at the Catherine Wheel public-house, Little St. James street, for Messrs. Watney & Co. Mr. H. J. Newton, architect:—

Grimwood & Sons	£698 0 0
Godden	667 0 0
Lamble	645 0 0
Hockley (accepted)	625 0 0

For laundry buildings at the Workhouse, Bethnal-green. Messrs. A. & C. Harston, architects. Quantities supplied:—

Sampson & Parrish	£3,100	0	0
Gough	2,898	0	0
Hearle & Son	2,856	0	0
Heiser	2,847	0	0
Crockett	2,795	0	0
Joselyne	2,664	0	0
Sawyer	2,594	0	0
Shurmur	2,583	0	0
Palmer	2,545	0	0
Parker & Evans	2,485	0	0
Wise	2,450	0	0
Johnson (accepted)	2,366	0	0

For new premises at Greenwich, for Messrs. Merryweather & Son:—

Sheffield & Prebble	£4,815	0	0
Lark	4,812	0	0
Harris & Woodrop	4,521	0	0
Kirk & Randall	4,326	0	0
Hobson	4,186	0	0
Downs & Co.	4,030	0	0
Jerrard	3,963	0	0

For block of warehouses, St. John-street, Smithfield. Mr. Ben. Tabberer, architect:—

Dickson	£12,995	0	0
Lane	12,993	0	0
Conder	11,490	0	0
Rider	11,488	0	0
Downs	11,450	0	0
Braid	11,400	0	0
Browne & Robinson	11,308	0	0
Mark	11,183	0	0
Merritt & Ashby	11,125	0	0
Lawrence	10,975	0	0
Sabey	10,860	0	0
Crabb (accepted)	10,685	0	0

For new factory, Chicksand-street, E., for Messrs. Noakes & Sons. Mr. James Tolley, architect:—

Marr (accepted)	£1,594	0	0

For rebuilding the Well and Bucket public-house, Bethnal Green-road, for Messrs. Truman, Hanbury, & Buxton:—

Marr (accepted)	£2,927	0	0

For completion of a villa residence in Camfield-road, Kilburn, for Mr. T. Yeo. Mr. Banister Fletcher, architect:—

Turner	£1,269	15	0
Butcher	1,091	16	9
Prout	973	0	0
Hobern	953	0	0
Whiteman	755	0	0

For No. 1 block of model residences at Trafalgar-square, Mile-end-road, for Mr. W. Nicholson. Mr. Banister Fletcher, architect:—

		Credit old materials.
Castle, Brothers	£1,860	£50 0 0
Price	1,635	115 0 0
Hobern	1,525	100 0 0

For the erection of a new steam laundry and premises, for the Camden Steam Laundry Company in York-road, King's-cross. Messrs. Thomas Bradford & Co., engineers:—

Colls & Sons	£9,325	0	0
Nightingale	9,162	0	0
Bangs & Co.	8,750	0	0
Gammon & Son	8,600	0	0
Downs & Co.	8,590	0	0
Merritt & Ashby	8,444	0	0
Mowlem & Co.	8,197	0	0

For the erection of three houses and shops, Nos. 137, 139, and 141, High-street, Poplar, for Mr. Thomas Rugg. Mr. E. C. Homer, architect:—

Staines & Son	£1,622	0	0
Boyce	1,577	0	0
Shurmur	1,485	0	0
Harper	1,475	0	0
Judd & Hawkings	1,397	0	0
Reddall	1,350	0	0
Alexander	1,349	0	0
Johnson	1,333	0	0
Sheffield & Prebble	1,287	0	0

For Public Baths at Aberystwith. First contract for swimming-baths only. Messrs. Wilson, Son, & Aldwinckle, architects:—

Fisher	£3,618	0	0
L. & J. Evans (accepted)	3,383	10	0
Rees	3,289	0	0

For laundry and boiler-house at Bethnal-green, for the Guardians of Bethnal-green. Messrs. A. & C. Harston, architects:—

Sansom & Parrish	£3,100	0	0
Goff	2,898	0	0
Earl	2,856	0	0
Izar	2,847	0	0
Crockett	2,795	0	0
Joslin	2,664	0	0
Sawyer	2,594	0	0
Shurmur	2,583	0	0
Palmer	2,545	0	0
Parker & Evans	2,485	0	0
Wyse	2,450	0	0
Johnson	2,366	0	0

For repairs, &c., at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road. Mr. W. F. Potter, architect:—

Hersee	£242	18	0
Pritchard	200	0	0
Hayworth	158	10	0
Butler (accepted)	128	0	0

For the erection of a pair of detached residences on the London Foresters' Asylum estate, Bexley Heath, Kent. Quantities by Mr. C. R. Griffiths, Mr. W. F. Potter, architect:—

Payne & Balding	£2,570	0	0
Woodward	2,399	0	0
Ayers (too late)	1,995	0	0

As the amounts exceed the expectations of the Committee, the matter is deferred for the present.

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